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Review Issue

August
1984
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Color Computer

MAGAZINE

For Users of TRS-80™ Color Computers

Radio Shack Color Computer Reviews Galore

- Education
- Games
- Home Management
- Communications
- Graphics
- Editor-Assemblers
- Business
- Books
- Hardware
- Utilities

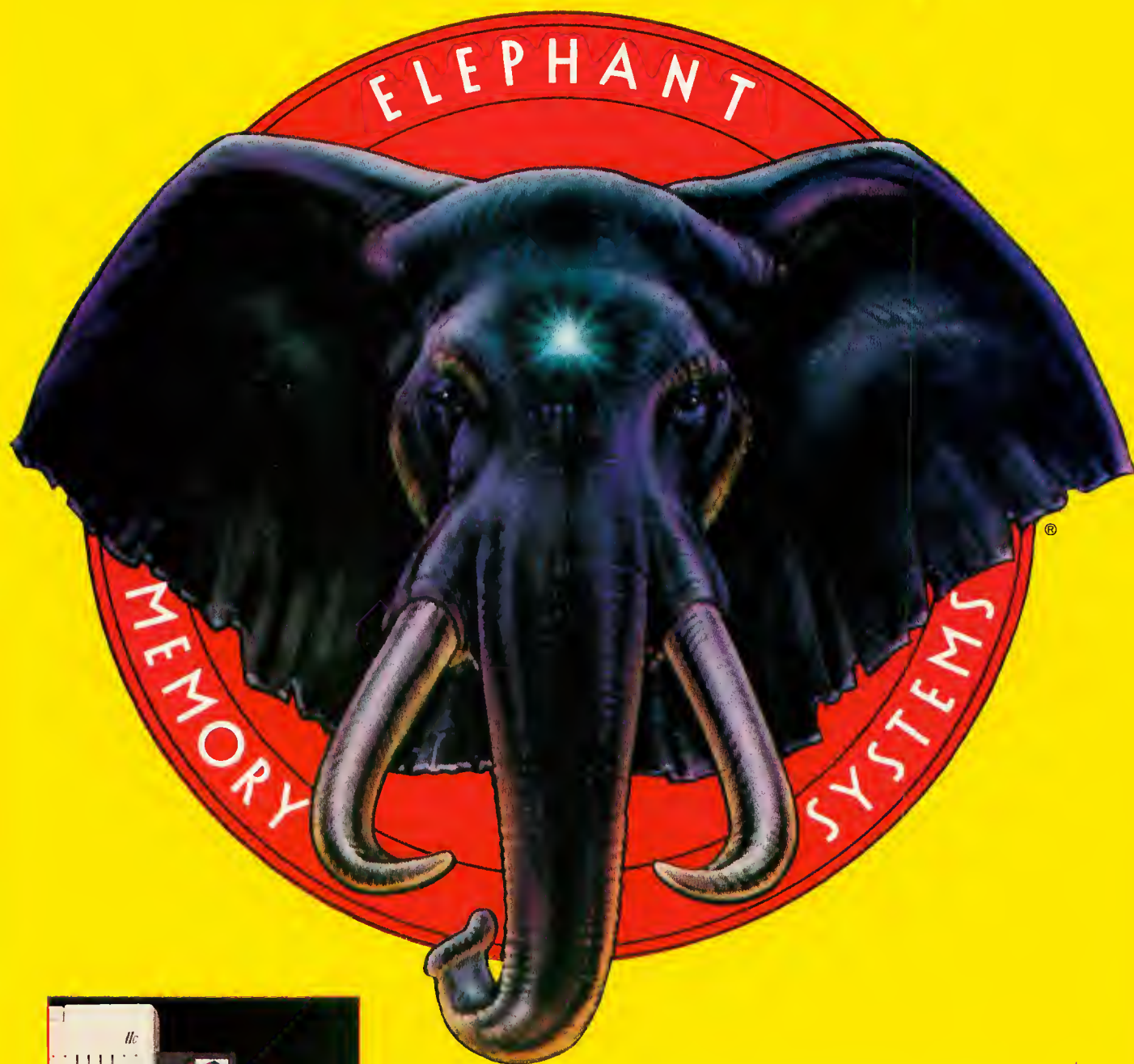


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07 WITH UPPER and lower case characters on your composite video monitor,
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12 INCLUDES POWERFUL FOUR MHz Z-80A MICROPROCESSOR
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16 ABSOLUTELY NO 64K CoCo OR CoCo II HARDWARE MODIFICATIONS NEEDED
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18 OPTIONAL Ultra Term + by Double Density Software: ALLOWS
19 YOUR CoCo TO OPERATE AS AN 80 COLUMN BY 24 LINE COMMUNICATIONS TERMINAL
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21 POPULAR CP/M SOFTWARE AVAILABLE
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Not A Game — A Very Realistic Flight Simulation



WORLDS OF FLIGHT (WOF) is a "view!" oriented flight simulation for the TRS-80 Color Computer, written entirely in Machine Language. "View" oriented means that the pilot may determine his or her position by actually viewing the surrounding landmarks as opposed to using instruments which sense navigational references. This is a major departure from "instrument only" simulations which can be achieved through BASIC programs. Most instrument maneuvers and procedures may be practiced. The craft is a light-weight, single-engine airplane with low wings. A nose wheel which is both steerable and retractable is also modeled. Some aerobatics are possible including sustained inverted flight, aileron rolls, spins and stalls.



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THE Color Computer

MAGAZINE

Vol. 2, No. 6
August 1984



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Language arts, math, history, science, memory tests, shapes, preschool, grade school, high school, and some specials for teachers.

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78/Utilities and Hardware

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COVER

"A Fine Presentation,"

by Peter Macomber

PEEK (08,84)



What better time of year than midsummer could we have chosen to fill your computing lives with reviews of lots of the great products that are available? Take it as leisure-time reading — you can plan your fall buying strategy over a nice cool glass of lemonade, and not feel any guilt because summer chores and fun keep you from trying out a newly published program. This is an issue to take to the beach with you!

Attention, kids and Color Computing For Kids parents: Jean Plesser will be editing a page written for and by children, coming soon in **The Color Computer Magazine**. Children who'd like to submit material — pictures, stories, graphics, programs, opinions, whatever strikes their fancy — should send them to "KIDS," **The Color Computer Magazine**, Highland Mill, Camden, ME 04843. We'll be looking forward to seeing lots of bright new ideas!

We're in the process of compiling an up-to-date, corrected list of all the Color Computer clubs currently in existence. If your club hasn't yet sent us information — include a name, the general area where users should live to become members, info on fees, dues, etc., and a mailing address and name and phone number of contact person — or if your club information needs to be updated, please drop us a note so we can include it in our INKEY\$ Club listings and our master list.

— D.M., Editor

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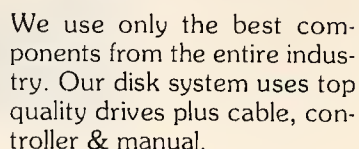
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Cassette \$24.95

Disk \$27.95

COLOR BASIC COMPILER

Now with Strings!!!

If you have ever written a BASIC program only to find that it runs too slow to provide any action & haven't had the courage to learn assembler, then The Color Compiler is the answer. It lets you write your program in easy Basic and then converts it into fast machine language. After you run your compiled program, you may find it necessary to add some delays because the Color Compiler will make your program run an average of 40 times faster!

The Color Compiler features a total of 55 commands and functions. Most of these are a subset of Extended Color Basic. The Color Compiler is limited to integer variables. All floating point can be done in a Basic program which calls the compiled program. Passing information from Basic to compiled programs is very easy. **And Strings are fully supported!** The Color Compiler generates position independent code so that you may put the compiled program anywhere in memory, including into a ROM-pack. It requires 32K and a disk drive, leaving 16K of user work space. (Room for a program with up to 200 lines and 100 line references.)

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STR\$				

Instructions Supported

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DIM	END	EXEC	FOR-STEP-NEXT
GET	GOSUB	GOTO	IF-THEN-ELSE
LET	LINE	MOTOR	ON n GOTO or GOSUB
PAINT	PCLS	PCOPY	PMODE
POKE	POKE#	PRESET	PRINT
PSET	PUT	READ	PRINT@
REM	RESTORE	RETURN	SCREEN
SOUND			



FOXY GRAF

FOXY GRAF is a complete graphics development package for the assembly language programmer. The very comprehensive manual covers the history of graphics, how the Color Computer graphics work, details Radio Shack & Motorola wouldn't tell, & is written in an enjoyable style. You can program with any mode in any color combination. It is totally relocatable & includes some very useful subroutines you can call from standard Basic. If you are serious about learning graphics programming, Foxy Graf is both a tutorial & a tool! (Requires 16K)

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Disk \$34.95

The same **Junior** you've seen in the **Kong** arcade series! This young but tireless little ape must overcome four screens of obstacles to rescue his father, The King, from mean old Luigi. He will traverse the jungle & swamp, climb vines, avoid vine gators, dodge Zuzu birds, open locks, & finally conquer Luigi's hideout before he finally frees his big daddy. (Requires 32K & a joystick)

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NEW Graphics Adventure



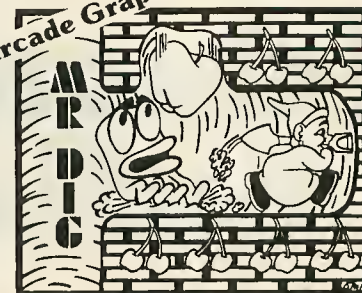
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In this real time graphics adventure set in Medieval times, your goal is to become ruler of the Middle Kingdom, which can be achieved only by returning the three Magic Rings to the Sanctuary. You must search the rooms of the Catacombs, Temple & Pyramid. Be warned! Trolls, monsters, & dangers lurk in these rooms! (Requires 32K)

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Arcade Graphics



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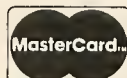
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"File It" Flaws

Keith Baker's "File It" (January, 1984) has two major flaws.

The first occurs when you save files. If you have a blank file anywhere before the last file you will lose all files from the blank file on. The following change will cure this:

```
534 FOR X = 1 TO REC :
IF X = (REC + 1) THEN 540
```

If you use the Print File command without having a printer, the program will lock up. This can be solved by the following change:

```
592 CLS: PRINT@ 160 "PRINTER
NOT ON LINE.....": FOR YT =
1 TO 1000:NEXT YT: GOTO
85
```

Robert L. Carr
Centertown, MO

Real-Time Monitor

Many thanks for a fine publication. When your issue arrives each month, I rush to try out the easy programs. They are quick and most of the time very interesting.

I am a senior citizen and a novice at this computer business. Usually, I'll type in a lot of errors and then I have to go through the program to ferret them out. My satisfaction is in being able to find and correct them.

I typed in "Real-Time Monitor" (INKEY\$, February, 1984) by Denis Santerre. It showed an error in Line 50 when I tried to run it.

One change solved the problem. Replace the semicolon in Line 50 after A\$ with a colon and voilà: the screen jumps!

Edwin A. Koupal
Sacramento, CA

No Case for Robin Hood

As a Color Computer owner as well as a supplier of Color Computer software, I would like to respond to the INKEY\$ letter headlined "Piracy Skepticism" by R. Hunter (December, 1983).

We read about how rich software houses are — articles on the software vendors mention sales as high as \$40 million dollars a year. Because these software houses do well, Mr. Hunter assumes all software houses are rich. Unfortunately, software houses that provide software for cheap computers are poorer than those that work with expensive computers.

Although many buy the Color Computer because it is powerful, most buy the Color Computer because it is cheap. As a result, the typical Color Computer owner's attitude is different from that of the owner of an IBM PC or other expensive machine.

The owners of a \$3000 computer appreciate quality — they can afford it, they want it, and they don't mind paying for it. They don't expect cheap, or free, software.

Let me answer a few specific comments from Mr. Hunter's letter.

(1) I fail to see why the amount of money involved in a loss suffered by a software house due to piracy of a product affects whether something is right or wrong. The loss of a single \$15 sale might be unimportant to a million dollar corporation but most Color Computer software houses are small.

(2) Surveys, independent or otherwise, don't always reveal the whole story. Trying to get users to tell the truth about whether they have ever given away or received pirated software is going to get you the same answer as asking whether they have ever given or received herpes.

(3) "If software was in the \$10 — \$12 range, I doubt if piracy would ever be heard of." Low price just makes people feel less guilty. I suspect there is less piracy of expensive programs than of cheap ones. Suppose a friend asks for a copy of your \$10 program — you will give it to him gladly. But when he asks for a copy of a program which cost you \$200, you will hesitate.

(4) "Tell me someone isn't getting fat when the going rate for a good game is \$25!! For the love of Mike — I can buy half an hour of the best 100-man symphony orchestra in the world for \$10!" Statements like this convince pirates that theft is a virtue: the old Robin Hood syndrome. I suspect that in many cases software piracy is a case of the rich robbing the poor! I would like to see proof that the average software author or vendor is getting fat.

The comparison of a good game with an orchestra doesn't hold water: when you buy a program, a royalty is paid to its author. Not true with a record; most of the record's royalty goes to performers. And the performers in an orchestra don't depend on record sales for their livelihood; most writers of computer software are totally dependent on individual sales.

You should also remember that the market for a record is much larger than that for a computer program. A record may sell for years; a game may be out of fashion in a few months. Even word processors or business systems only have a lifespan as long as the computer they work on.

Finally, you get more with a program, and that costs more; an instruction manual, technical support from the company, trained salesmen and a perfect copy of the program — a single lost bit entitles you to another copy. How often do you get a phono record that doesn't have a single click or pop?

It all boils down to the economies of scale. When you sell millions of copies of a record, and get additional revenue from radio performances and concerts, you can afford to make peanuts on each. But when your sales number in the hundreds or low thousands, you must make more on each copy to survive.

Peter A. Stark
President
Star-Kits Software
Systems Corp.
Mt. Kisco, NY

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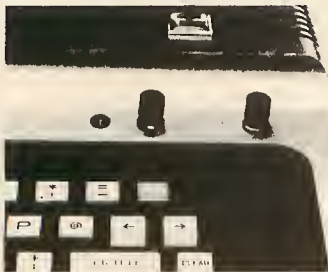
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INKEYS

DBM and Printer

"Your Basic DBM" by Paul Detwiler (March, 1983) is an excellent DBM for home use and is further enhanced by Charles Jefferson's upgrade in "Modified Basic DBM" (March, 1984).

I thought I'd pass on to your readers a short routine I've written which allows output to a printer. My system is composed of a cassette-based 32K Color Computer with a Radio Shack DMP-100 printer.

The changes and additional lines which follow are based on the RENUM 1,1,1 renumbering routine as suggested in the aforementioned Jefferson article. Changes:

Line 37 — I had no need for the "Load Another File" routine so changed this to "Output to Printer."

Line 40 — Delete

Line 41 — Add 247 at end of line.

Print Routine:

```
247 INPUT "DATE";AA,BB,CC
248 CLS PRINT@102, "TURN
ON PRINTER" FOR R = 1 TO
1000 NEXT R CLS
249 PRINT#-2,TAB(25)N$
250 CLS: INPUT"MISC.
DATA";M$
251 PRINT#-2:
PRINT#-2,TAB(21)M$
252 PRINT#-2:
PRINT#-2,TAB(21)"DATE-";
AA"/"BB"/"CC
253 PRINT#-2:
PRINT#-2,STRING$(80,"-")
254 PRINT#-2
255 P = INT(16/(N + 2))
256 FOR X = 1 TO Q-1
STEP P
257 FOR Z = X TO X +
(P-1)
258 IF Z >= Q THEN 266
259 PRINT#-2,"RECORD #"
```

Ed Wilson
Augusta, ME

Whodunit?

The February, 1984 issue of **The Color Computer Magazine** listing of the Whodunit program seems to be clipped short in Lines 850 - 880 and Lines 880 - 920. Page 106 has an ad that apparently extended into the program.

Keith A. Scott
Byron, WY

The column on the right side on page 106 had the top half and bottom half reversed.

— Eds.

Morse-Code Cx

In your March, 1984 issue you printed a program called "Morse Code Generator" for Color Basic. In this program I discovered an error: Line 60 contains the Extended Basic command LINEINPUT.

To fix the error retype the line using INPUT in its place.

John Schroettner
Center Valley, PA

Some Good Guys

Just a line to tell you how much I enjoy Commander, Tietjen, Barden, Kepner, and Dr. Kimmelman. Ramella, my grandkids love ya!

Now, down to other business. I wish to commend the following advertisers:

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Joseph R. Feagans
Tallula, IL

Don't Forget Leap Years

I appreciated very much Norman Garrett's date subroutine in the article "How To Remember Not To Forget" (January, 1984). I have been struggling with a schedule planning program and found that this subroutine fits into my program very nicely — except for one limitation. It works fine for all dates except those falling after February 28 in a leap year, for which it is off by one day.

I offer the following modifications which allow the program to test for a leap year and then make adjustments accordingly. Since the subroutine can be entered at more than one place, the leap year test must be made in two places: Lines 50060 and 50297. The other changes allow the program to run as originally printed in non-leap years, but adjust for the extra day after February 28 in a leap year.

Your printed version was obviously a cut-down version since there were two UL errors included. These have been corrected in my modifications. I include only those lines which are added or require changes.

Tom Hopkins
Charlotte, NC

```
50060 XD = VAL(XY$): XQ
= XD/4: IF (XQ-INT(XQ)) =
0 THEN Z = 1 ELSE Z = 0
50063 XD = XD*1000
50090 GOSUB 52045
50135 NG = (INT(XD/1000)*
1000): IF XD-NG<365 THEN
GOSUB 50860
50297 XQ = NG/4: IF
(XQ-INT(XQ)) = 0 THEN Z =
1 ELSE Z = 0
50310 IF W3 < (60 + Z) THEN
50390
50315 IF W3 < (91 + Z) THEN
50405
50320 IF W3 < (121 + Z)
THEN 50420
50325 IF W3 < (152 + Z)
THEN 50435
50330 IF W3 < (182 + Z)
THEN 50450
50335 IF W3 < (213 + Z)
THEN 50465
50340 IF W3 < (244 + Z)
THEN 50480
50345 IF W3 < (274 + Z)
THEN 50495
```

```
50350 IF W3 < (305 + Z)
THEN 50510
50355 IF W3 < (335 + Z)
THEN 50525
50365 W5$ = STR$(W3-(334
+ Z))
50410 W5$ = STR$(W3-(59
+ Z))
50425 W5$ = STR$(W3-(90
+ Z))
50440 W5$ = STR$(W3-(120
+ Z))
50455 W5$ = STR$(W3-(151
+ Z))
50470 W5$ = STR$(W3-(181
+ Z))
50485 W5$ = STR$(W3-(212
+ Z))
50500 W5$ = STR$(W3-(243
+ Z))
50515 W5$ = STR$(W3-(273
+ Z))
50530 W5$ = STR$(W3-(304
+ Z))
52065 IF W1 = 3 THEN W1
= (59 + Z)
52070 IF W1 = 4 THEN W1
= (90 + Z)
52075 IF W1 = 5 THEN W1
= (120 + Z)
52080 IF W1 = 6 THEN W1
= (151 + Z)
52085 IF W1 = 7 THEN W1
= (181 + Z)
52090 IF W1 = 8 THEN W1
= (212 + Z)
52095 IF W1 = 9 THEN W1
= (243 + Z)
52100 IF W1 = 10 THEN W1
= (273+ Z)
52105 IF W1 = 11 THEN W1
= (304 + Z)
52110 IF W1 = 12 THEN W1
= (334 + Z)
```

The Overlying Problem

I enjoy your publication very much. I bought a Color Computer when they first came out. What started out as an expensive toy has turned into a very useful tool. I use it for everything from playing homemade games to keeping stats at the office. I even wrote one program that turned a monthly nightmare called the operation report into a simple half-hour jaunt through the keyboard.

I am hoping that some manufacturers of soft- and hardware read this column to get a feel for consumer needs. Like many Color Computer owners, I have programs that came with

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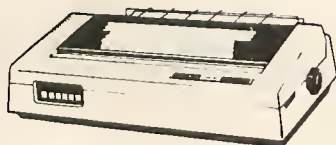
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INKEYS

keyboard overlays. And like many others, I have changed my keyboard to a full-stroke type. I bought the HJL-57.

The full-stroke keys make it so much easier to type, but now I cannot use my overlays. It's no big deal, especially if you are familiar with the keys and functions; however, some new method for labeling keys could be handy and for me would be a selling point that could persuade me to use one product rather than another.

Joey Chevere
Waukegan, IL

Consumer Complaints

We have received a bit of mail lately concerning various problems between many of our readers and Softlaw Corp. Readers' complaints referred to claims of misleading advertising, product unavailability, and unresponsive customer service on the part of Softlaw. Softlaw says it has been beset by a number of problems which resulted in the avalanche of complaints. Who's right and who's wrong? It's hard to say; with the presentation of this representative reader letter alongside Softlaw's response, it's up to you to decide.

Enclosed you will find my copy of VIP Database. I am returning it because I believe it not to be as advertised. Your ad states "the math package even performs arithmetic operations and updates other fields." Nowhere is the 64K prerequisite for the math package stated. Surely you must realize how misleading (unintentionally, I'm sure) your ad is. Due to the delay in shipment I also wish to cancel my order for VIP Calc. (Also) the Softlaw responses to my (telephoned) complaints are among the most unprofessional and insensitive I have encountered during my

17 years in the data processing business.

Martin B. Lechner III
Des Peres, MO

Dear Mr. Lechner:

After reviewing your letter it is apparent that you have a 32K machine and are unable to use the VIP Database math package. Since you no doubt ordered the product when it was not indicated that the math package requires 64K you are entitled to a refund. We would like to apologize for the inconvenience. Our clerical staff did not understand the nature of your complaint.

Regarding VIP Calc, that poor old program has needed its own spokesperson for quite a while. It started as a wonderful idea in 1982. It was estimated that at worst it would take four months to complete. In hindsight this was utterly absurd. We had trouble from the outset. Our programmer had to be pulled from the project to implement the high resolution displays on other programs. By the time that was done it was mid-May, 1983. Still, we felt that Calc could be completed by late July. The program was moving nicely. The math, the guts of the program, was being saved for last. We were assured that the math was just a matter of a week. The end of July came and quite a few things still had to be done. The schedule was revised for a September 1 completion date. Of course, by then the Calc was being advertised, since we were cocksure we could meet all commitments. August was the beginning of the work on the math package, but the routines just wouldn't get done, despite rosy predictions by our programmer. Bugs crept up at every turn.

By November 1 the package was "complete." But other problems arose. One was the thorny problem of changing from base 10 to base 2 for the computer to use, then from

Your College Future Starts Today



TYPE Node = RECORD
Next : Node;
NodeName : String(15);

TYPE Month = (Jan, Feb, ...)

MthDys : ARRAY [Month] OF 28..31;

WITH ThisNode DO
Next := Next.Next;

READ (A,B);
WRITELN ('RESULT', 3.2E5*SIN(A));

CASE ThisMonth OF ...

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INKEYS

base 2 back to base 10 for users to see. This caused display problems with small fractions which we found intolerable. We licked the problems, but it took another month. Then, with all the features we had planned, the program became immense. Basic won't load programs over 32K long. We had to write a special loader. Another week or so went by.

Of course, all this time people were calling in, ordering, and being told that shipment was just around the corner — the "in two weeks" syndrome. Periodically, when we discovered that these predictions were too optimistic, we sent letters imploring customers to cancel if they were the slightest bit inconvenienced. Many did, and were gladly refunded or credited. Of course, tempers wore fairly thin around here, and I think it fair to say that the Calc has made nervous wrecks of several of us.

We have been asked many times why we continued to advertise when the Calc was not completed. The honest answer is poor judgement and over-optimism about completion. Copy for advertisements is required a month or so in advance. It was easy to get caught feeling that the program would be done by then. "Early advertising" will never again occur with any of our products!

For those of you who were inconvenienced, we wish to extend our deepest and most sincere apologies. We would also like to thank the many of you who so kindly attempted, beyond all reason, to understand and sympathize with our problems. For those of you who may be tempted to advertise before the product is done and in your hands, take a bit of painfully learned advice: don't.

David P. Nelson
President
Softlaw

Eds. note — See additional comments in this month's End of File.

Checksum Query

I really enjoy my subscription to **The Color Computer Magazine**, but debugging all those Basic programs can really be monotonous. As a solution, I suggest a program which will provide checksum values for every line of a given program. To use this debugging system after initially entering a program, run checksums and compare each value to the corresponding value in the magazine. To save magazine space and editor time, all checksum values could be listed at one place in the magazine — say at the beginning right after the PEEK section.

Steve Olson
Madison, CT

It's an idea that would save a lot of time and frustration, except for two "space" problems.

Long programs would benefit the most, but as they can easily be 200 or 300 lines long, space for them is already tight. A table of 300 line numbers and their checksums could fill a page and more, making a big listing bigger.

Many readers would find their checksums do not agree with the magazine's, even though their version appears identical to the magazine's; and it may even run without errors. This is because unneeded spaces (included in most listings for readability) are counted in the checksum. Most readers are not willing to type in a listing exactly as it appears unless they are told they have to for the program to work.

Unless someone thinks of a better solution, we will continue putting checksum routines only in programs with critical and hard to type lines, such as numerical data in Basic loaders for assembly language, and programs with many lines of string data that may cause Function Call errors in other lines.

— Eds.

THE COLORSOFT™ BUSINESS SYSTEM

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All programs require a minimum of 32K and 1 disk drive but will take advantage of 64K and multiple drives. Each package features a hi-res 51 x 24 black on green screen. 16K versions available without hi-res screen. Specify 16K or 32K versions when ordering. Future integrated packages will include: Inventory Control, Sales Analysis, Accounts Payable.

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New OS-9 Utilities from Brian Lantz Computerware offers "Text Tools"

Noted OS-9 programmer and author **Brian Lantz** has joined with leading OS-9 vendor Computerware to offer an impressive group of **OS-9 utilities** called "**Text Tools**" which sells for **\$29.95**. Review the list of powerful commands that follow and you will see why every OS-9 user will be adding the **Text Tools** to his library! You'll see similar "Unix-type" commands from other companies with prices of up to \$50. But why pay more than Computerware's \$29.95 when you can get top quality from real experts? Order the OS-9 Text Tools today!

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Sanctuary - Finally, a brave adventurer returned the three golden rings to the Sanctuary and was crowned ruler of the **Middle Kingdom**. This ends the gruesome carnage of warriors, merchants, and magicians that have been murdered and maimed by all varieties of monsters as they searched the dangerous Catacombs, Temple, and Pyramid for the precious rings. This Middle Kingdom **adventure** can be replayed in **graphics** for \$24.95 on cassette or \$27.95 on disk. Could you be crowned ruler? (Req. 32K)

JDOS - Available Separately

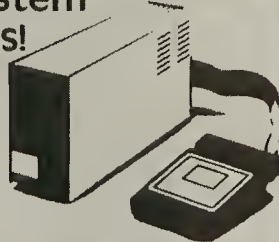
Computerware announced they have a limited supply of JDOS (rom and manual) sets available for \$39.95. JDOS is the new J & M disk operating system which supports double sided drives and has many other attractive features.



The Sourcerer Reveals All...

If you like to take things apart to see how they tick - if you want to see the hows and whys of assembly language programs - the **Sourcerer** is your tool! It's an easy-to-use, menu-driven **disassembler** that produces symbolic source code that can be assembled by most of the popular editor/assemblers. (Yes, OS-9 users, it will disassemble the mysterious OS-9!) It's available on cassette or disk; disk versions for RSDOS, FLEX, & OS-9. So anyone can take a closer look! At \$39.95 on disk or \$34.95 on tape, you owe it to your curiosity!

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Disk systems included top quality drives, J & M controller, cable, & manual. (Add \$15 for RSDOS.)

Single drive, single-sided	\$400
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Bio Detector Results Not Admissible In Court

The truths and untruths have been exposed. The suspect's inner mind has been tapped through the "galvanic skin response" sensors of the **Bio Detector**. The reaction to every question was displayed with color and sound on the CoCo screen for everyone to see. Yet the culprit is freed on a technicality - Bio Detector results were not admissible in court. But at least the truth is out! You too can tap into the truth by hooking up your family, friends, and "others" to Computerware's **Bio Detector** and your CoCo. Just ask questions and watch the graphic screen. The truth will come out! (Just \$29.95 for all hardware, software, and fun. Req. 16K)

Programmers Applaud New Basic Utilities and Print Spooler

A new aid to the serious Basic programmer released by Computerware has proven to be essential. It gives the 32K system a 2K print buffer and the 64K system a **32K print buffer**. WOW! Other utilities include a Basic **cross reference program**, a dump for values of all Basic program variables, a 51 x 24 screen display for 64K users and more. At \$19.95 for cassette or \$24.95 for disk, every programmer should have one!

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- In addition to the DOS manual, a 20 page **technical manual** documenting every detail of disk drive performance & specification.



from Computerware®

CoCo Owners Use Video Plus to Interface Monitors



New NAP Monitors Have Built-In Audio Speaker!

Computerware has made special arrangements with North American Philips (familiar for Magnavox & Sylvania brands). Their green and amber composite video monitors are the only monochromes on the market with built-in audio. And they are still very affordable! Check out Computerware's full line of monitors.

NAP green	\$109.95
NAP amber	\$119.95
Color (Comrex or Amdek)	\$265.00

Flexi Filer Price Slashed - Now Only \$54.95!!!

Computerware's popular data base system now includes the powerful file manager, making **Flexi Filer** a super buy at the new reduced price. It comes with a useful personal inventory format as a starter and has been used for such applications as sales analysis, sophisticated mailing lists, property locator & descriptor, business inventory - the lists goes on! Flexi Filer can be tailored to meet almost any need and is now affordable to all. (Req. 32K & disk)

CoCo users can now take advantage of the crisp display of a **composite video monitor** by installing one of Computerware's **Video Plus** interfaces. They are inexpensive, completely assembled, and easy to install. It also provides audio output for monitors with audio. There are three models depending on the kind of monitor and whether you have the original CoCo or CoCo II.

Video Plus (original CoCo & either color or monochrome monitor)	\$24.95
Video Plus IIM (CoCo II & monochrome monitor)	\$26.95
Video Plus IIC (CoCo II & either color or monochrome monitor)	\$39.95



PASCAL Price Reduced!!!

Now anyone can explore the advanced language of Pascal with Computerware's affordable 32K subset of standard **Pascal**. Though it omits floating point and some sophisticated data structures, the user can enjoy learning the basics of this popular language and accomplish virtually any programming task. The cassette version (\$39.95) includes compiler, P-code interpreter, supervisor, editor and sample programs. The disk version (\$54.95) has added features like graphics, joystick, sound and directed I/O and includes compiler, P-code interpreter, supervisor and samples. The disk version with the Advanced Editor is available at \$74.95. Finally, an **affordable Pascal**!

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OS-9 users are finding quality products at Computerware! The **Advanced Editor** is a much needed, comprehensive program editor. The **Disk Fix & OS-9 Utilities** package allows full use of drives like double sided, extended track, and fast step rates plus some very powerful and useful utilities. To explore how things "tick" the **Source-er disassembler** is a handy tool! **Random Basic** offers some significant advantages like extended precision and graphics. Computerware also carries Elite Word, O-Pak, and C-Compiler. Write for a complete **catalog** from the OS-9 experts!

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With **Synther 77** you can tune your keyboard to any of a hundred different voices (or instruments) then play music right on the keyboard. Some users groups have formed CoCo bands, playing familiar tunes together and saving their favorites to disk or tape. The pro musicians love the technical fine tuning factors like vibrato, bender, boing, attack, sustain, and decay. While the novices can enjoy just playing along and experimenting. **Synther 77** requires 32K and costs only \$24.95 on cassette or \$27.95 on disk. It will bring hours of listening and playing enjoyment to all.

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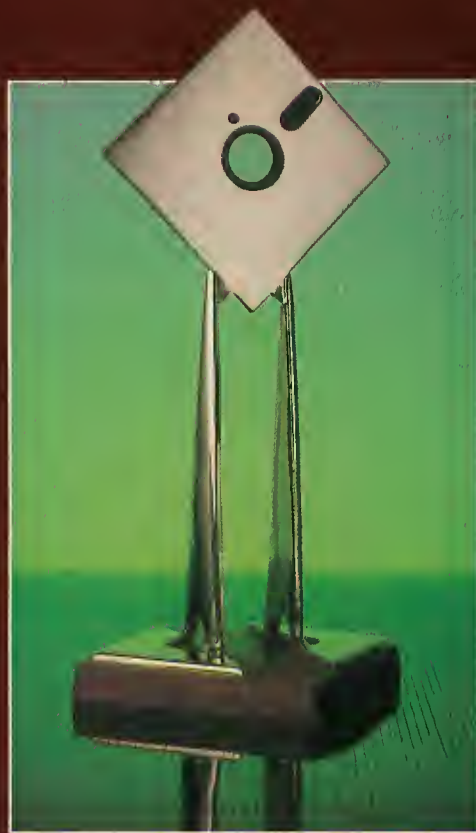
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EDUCATION



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Captain Computer and Micro Mouse Comic Coloring Book

by Robert E. Williams &

Richard H. Mezejewski

Illustrated by Michael T. Coy

Management Information Source, Inc.

3543 N.E. Broadway

Portland, OR 97232

\$6.95, softcover

If you've ever kicked yourself for not having invented some of life's more simple successful ideas (like the pet rock, for instance) read no further — this might upset you. A San Franciscan by the name of Robert E. Williams has grasped the obvious before the rest of us.

"Look on the supermarket shelf. Is it a book? A magazine? No it's a Captain Computer and Micro Mouse comic coloring book!" Slick, yet mild-mannered, Captain Computer knows all about computers. His faithful sidekick Micro Mouse is like a rodent-shaped sponge soaking up all the wisdom the Captain has to offer.

Children love to color. As fun exercises in computer familiarity for kids, Williams, co-author Richard H. Mezejewski, and illustrator Michael T. Coy have hit a bull's-eye. Children growing up today will be as familiar with computers as baby boom offspring were with TV. By using an environment as natural as coloring books, Williams is correctly assuming the computer to be an everyday object that children should identify and learn about at the earliest stages of their development. There are coloring books that show cars and point out the doors, tires, bumper, and windshield wipers, and coloring books that show the difference between a cat, a dog, and a mouse. Captain Computer handles the high-tech facts of life.

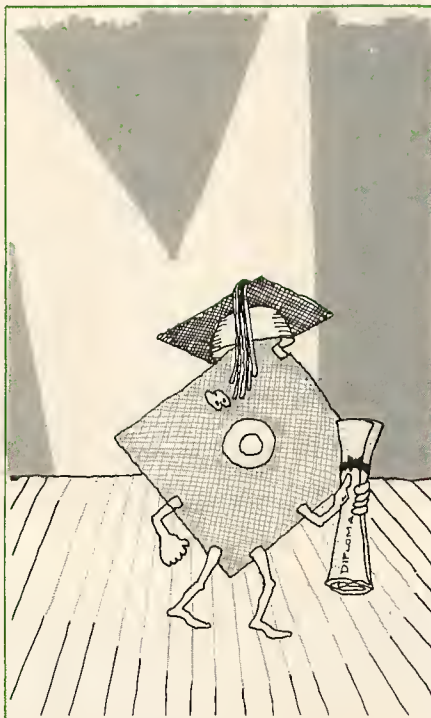
The problem is, it is not well done. With Captain Computer's focus on fun plus education, the comic book must be strong in both categories. The fun is certainly there; the pictures are big, with plenty of opportunity for using

lots of different colors on each picture, and every kid loves superheros and cute mice. But it seems less time and effort were spent on the comic's educational aspects.

The story progression has Captain Computer pointing at different computer parts and peripherals and telling Micro Mouse what they are. All too often the art does not cleanly execute the dialogue. For instance, during the comic book's opening panels about keyboards, Micro Mouse, standing on the keyboard, asks, "Are these special function keys?" One hand is pointing downward just beyond the keyboard and the other hand is pointing upward toward the ceiling. I have no idea what keys the mouse is pointing out. Captain Computer seems to know: maybe that's why he's the star of a comic book, and I'm not.

Seriously though, I wonder whether the authors were overdoing their coloring computer tour by pointing out function keys. They are not something a coloring three-year old, or even seven-year old, will need to know in even the remotest application.

Later Micro Mouse is shown a cassette player, yet the caption reads,



"Cassette." When Captain Computer tells his little friend that he can use the same cassette recorder for his computer as he can for music listening, the mouse is amazed and replies, "Gee Captain, it's like a disk drive." An intrusion from left field; disk drives are not introduced for another six pages. The child learning from the comic book cannot compare the speeds of cassette data storage against something called a disk drive he has not yet seen. It happens again on the next page when Micro Mouse is shown a cartridge and asks if it is different than a floppy disk. "Disk drive, floppy disk," the five-year old asks himself — "what are they talking about?"

The comic book continues in a manner indicative of poorly produced educational products. Its editorial focus seems directed at the computer-ignorant parent, while its activity level is for a child. As the comic progresses, it touches base with synthesizers (a very large word for a child), printer plotters, dot matrix and letter-quality printers, modems, and portable computers.

The first aspect of writing anything, be it a magazine article, a novel, or a comic book, is to identify the intended readership and write for it. Captain Computer grossly violates that golden rule of writing. Children using coloring books do not need to be told about the difference between the data storage rates of cassettes and disks, or the difference between dot matrix and letter-quality printers. The comic book's authors are guilty of information overload and confusion about their readership.

They have a terrific idea in Captain Computer. Children are capable of learning without having their noses rubbed in the lesson. A computer superhero and a sidekick mouse on wondrous adventures in which they use, or encounter computers, is enough to entertain and educate youngsters about the high-tech world we are building for them. Forget the tutorial nonsense and let Captain Computer fly.

— Kerry Leichtman, staff

Ernie's Magic Shapes

by Children's Computer Workshop
Radio Shack

1400 One Tandy Center
Fort Worth, TX 76102

(817)390-2959

\$19.95 cassette, 16K

Ernie's on stage, top hat on head, magic wand in hand. The Sesame Street star waves his wand and a colored shape appears on the screen. A second wave brings a second shape, and a problem to be solved. Does it match the first?

Ernie's Magic Shapes is one of ten preschool home education programs written by the Children's Computer Workshop (CCW). (See **The Color Computer Magazine**, September 1983). It's sort of an electronic coloring book, but is really a reading readiness exercise (in education-ese, a "visual discrimination" exercise). It works because perceiving similarities and differences between shapes is a natural lead-in to doing the same with letters and words.

If children think they see a matched pair they press the Up Arrow and wait for a few seconds.

Ernie considers the second shape, and moves his head to look at the first. Then he shakes or nods his head to deny or confirm that the answer was correct. Pretty neat, huh?

Ernie's delay in answering is a key element of good questioning skills because children will use the time to reconsider rather than forget the question and wait for the response. Being right is important, but thinking about answers is equally important.

Other aspects of the program are similarly well-designed. Movement is minimal, therefore so is distraction. Sound reinforces movement, but is also kept to a minimum. Thinking time is quiet time. Letters and numbers appear on the menu only.



Because it has various difficulty levels, this program is useful at school as well as at home. I watched a kindergarten class lose itself in it for two days. One special education teacher I know prefers it to Logo as an introductory computer experience. Despite its simplicity, she says, Logo is still too abstract for many tots. Ernie is not only cute, he's concrete, and that's where the kids are at.

— J. Craig Dickinson

Kids' Choice and Early Letter Recognition

Software Specialists

P.O. Box 2029

Princeton, NJ 08540

(609)443-6782

\$12.95 each, cassette

\$19.95 both

Are colorful, animated, randomly selected displays of numbers and letters interesting enough to keep a preschooler coming back for more? Nicole's Dad (Steve Welzer) believes so — he wrote these two programs.

Kids' Choice and Early Letter Recognition are designed simply to entertain the three- to six-year old. They can easily be turned into learning games by an enterprising adult. A preschooler will need that adult around at first, anyhow, because all the instructions are in writing — no verbal directions are given.

Each program presents a menu of choices. The youngster selects a number from zero to nine in Kids' Choice or one of the 26 letters from A to Z in Early Letter Recognition by pushing the corresponding letter or number on the keyboard.

Then the child can sit back and watch a colorful animated display of the chosen item. The letter may be large or small, may appear and then change its color and form, or may slowly draw itself to fill the entire screen. The number may show itself in its familiar printed form, be part of a clown's face, be the number of mountains on the screen, or be hidden in a picture of a man fishing.

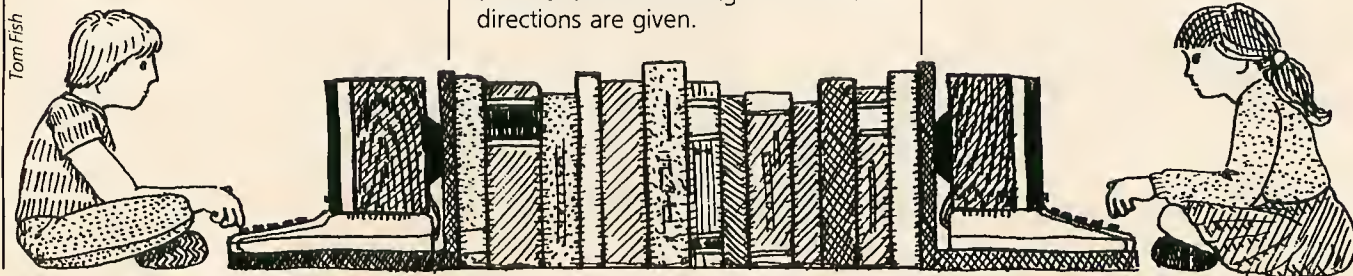
Each letter in Early Letter Recognition has an animated display which the child can call up through the menu. Some of these are amusing, some colorful; some long, some short. Pressing z elicits the alphabet song and all the letters.

There is no interaction during the letter display between the program and the child. After one display ends, the program returns to the menu and waits for the child to press another letter. Pressing a wrong key (except the Break key, which has not been disabled) elicits no response from the program. The menu remains in place waiting for a letter. An adult can prompt the child for a specific letter and in this way turn the program into a learning game. After awhile the child will come to recognize the letters by name.

Kids' Choice is a slight variation on the Early Letter Recognition program. In Kids' Choice, one of three randomly determined graphics displays appears for each number chosen. Some displays allow interaction between the child and the program. Several displays need the presence of an adult to explain their workings. For instance, a display for the number 8 shows eight notes which can be played by pressing the A, S, D, F, G, H, J, or K keys on the

Courtesy of Tandy Corporation

Tom Fish



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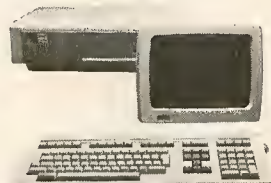
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keyboard. Once a child has mastered the menu selection process and knows what to do for each display requiring interaction, he should be able to run the program on his own.

I don't possess a passel of pre-schoolers on which to test this program, but the one I corralled to do the job found the Early Letter Recognition program fascinating and toyed with Kids' Choice awhile too. Even my 12-year-old, computer-sophisticated son admitted he liked the displays for certain letters, so the programs must be doing something right.

"Even my 12-year-old, computer-sophisticated son admitted he liked the displays."

Both programs are written in Basic and come with clear, concise documentation. Each program appears three times on the unprotected tape and the instructions note their approximate counter locations. You can easily find the second or third save if the first one refuses to load. Each program requires about 8K of memory and Extended Color Basic.

These colorful and interesting programs may appeal to your youngster, but do be prepared to sit through the first session or two with any pre-schooler. Played by a child alone, Kids' Choice and Early Letter Recognition are really entertaining exercises in associating the keyboard with a screen display. Under the guidance of an adult prompting for a specific letter or number, however, the programs can teach a child to recognize letters and numbers by name.

— Martha Sheldon

Bumble Games

The Learning Company
Distributed by Follett Library Book Co.
4506 Northwest Highway
Crystal Lake, IL 60014
(800)435-6170

**\$45 tape, \$65 disk
16K Extended Color Basic**

Bumble Games is part of The Learning Company's series of entertaining educational software. It is directed towards kids from age four to ten.

Bumble is an imaginary creature from the planet Furrin who needs help learning how to identify places on arrays and grids. The purpose of the game is to teach arrays and grids.

A main menu lists Bumble Games' five programs. Some games are designed for single players, others for a couple and some ask the child's name. Let's examine each game in turn.

Find The Number asks a child to find a hidden number on a horizontal or vertical line. Six digits, from 0 to 5, are marked on the line, with one of them the correct number. If a child guesses wrong, a greater than (>) or lesser than (<) symbol is displayed, indicating a higher or lower guess is needed. This game continues until the correct number is found. Find The Number introduces the two < > symbols and the idea that a reference point (the hidden number) can exist on a line.

Find The Bumble is Bumble Games' introduction to grids. A 4 by 4 grid illustrates row and column terminology. Again the youngster must find a hidden spot, but this time must enter two coordinate points, in letters and numbers. Intersecting lines are drawn to show the point chosen. Incorrect answers are guided with arrows and text that lead to the right destination on the grid. As in all these games, numbers or letters entered outside of the indicated range are ignored.

The two-dimensional array concept continues with Butterfly. The grid here is increased to 5 by 5 and terms such as up, down, left, right, > and < are used. Again numbers and letters are used to determine the correct reference point.

Visit From Space opens with a spaceship (from the Bumble planet Furrin) landing unseen behind a planet. Game players have to find the missing spaceship on a 5 by 5 grid, but this grid uses numbers on both the X and Y sides.

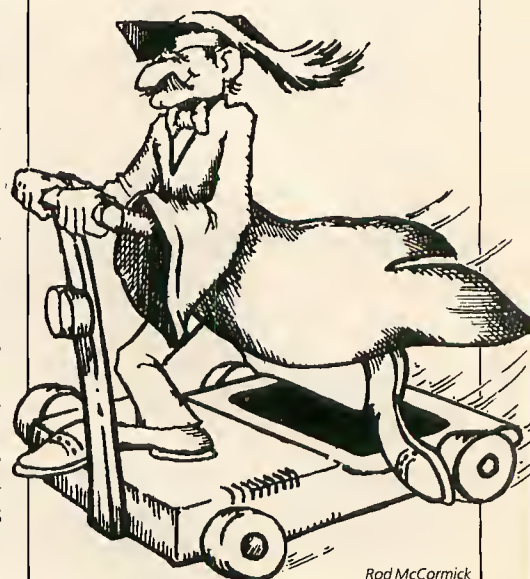
Tic Tac Toc, a version of tic-tac-toe, is for two players. The first player to line up three markers horizontally, vertically or diagonally wins. This time the child must enter both X and Y points at the same time, separated by a comma.

In all of these games, the Left Arrow erases any input. As coordinate points are entered they are also displayed off to the side of the grid for better comprehension. When a player has three markers in a row a funny stick figure jumps up and down beside the winner's name.

Finally, Bumble Dots allows the child to create his or her own sketches. Working on an 11 by 11 grid, the player can trace over one of four Bumble drawings or create originals. Each Bumble drawing is subsequently more complicated than the last. A dot for each reference point of the illustration is shown on the grid and the child must specify its coordinates. When all the correct X and Y points are entered, the grid disappears and the illustration comes to life with bright colors and music. Children can create their own sketches, name them and have their friends try to trace their reference points on the grid. Unfortunately, these sketches cannot be saved for later reference.

Overall, Bumble Games is a worthwhile piece of software. The programs are well-designed and a good introduction to array and grid concepts. Though each individual program offers on-screen help and instructions youngsters will need a little adult assistance at first.

— Richard Butt



Rod McCormick



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Atom

Radio Shack
One Tandy Center
Fort Worth, TX 76102
Joysticks required
\$19.95



Atom introduces a child to the world of subatomic elements. The object of the game is to build an atom for each of the game's 54 elements as quickly as possible.

When building elements the child is expected to learn the name of each element, its atomic number and configuration, and main properties. Instruction is reinforced by display of a Periodic Chart of Elements after each round. The chart displays each element's full name and main properties.

Included with the game cartridge is a 12-page guide book describing the program's objectives and game rules. The well-written documentation also describes the subatomic world, illustrating how matter consists of atoms, how atoms are broken down into protons, neutrons and electrons, and the various properties of those parts. A large, colorful wall poster included with the package reinforces the Periodic Chart of Elements by depicting these elements grouped into families with their atomic weight and characteristics.

The playing screen consists of a pulsating nucleus surrounded by two rings of moving dots. The inner moving dots represent an energy level ring,

and the outer dots a barrier ring. Surrounding these rings are free-floating electrons. The player must build an atom by picking up (via the joystick) an electron and shooting it into one of the inner energy ring's holes. Once you have successfully fired the first electron into a hole, you've created the simplest element, hydrogen. The game continues from there, each new element requiring more and more electrons, right up to Xenon, with 54.

To make things a little more difficult you have to beat the clock that's ticking away in nanoseconds, located in the top left-hand corner of the screen. The three other corners of the screen contain bunkers; behind one of these your graviton is hidden. The graviton is controlled by joystick and is used to pick up and shoot electrons.

Controlling the graviton requires patience and a lot of practice. To move the graviton towards the center of the screen (towards the nucleus and surrounding rings) you must shift the joystick forward; pulling the joystick backwards (toward you) moves the graviton away from the nucleus. Shifting the joystick towards the left or right rotates the graviton clockwise or counter-clockwise around the nucleus. Graviton movement takes considerable practice to perfect.

Once you have gained some reasonable control over the graviton you can start searching for electrons. If the graviton bumps into anything on its search you'll be destroyed and will have to start again.

Firing an electron into the inner energy ring isn't simple, either. Be careful to avoid the outer barrier ring of dots; hitting one of those causes the atom to start rumbling and, within a few seconds, to explode, destroying everything in its path (including your graviton)! That's where the bunkers come in handy. If you can get behind a bunker before the atom explodes you'll be safe.

Because joystick control is difficult to master and the exploding atoms got me nervous, I often smashed my graviton into a bunker, losing it in the attempt to avoid destruction!

Atom is an interesting game to play and a real challenge when you attempt to build elements containing many electrons. At times I found myself skipping over the Periodic Chart of Elements just to get back to the arcade action, though doing so defeats the educational aspects of the game. If you're not going to take the time to

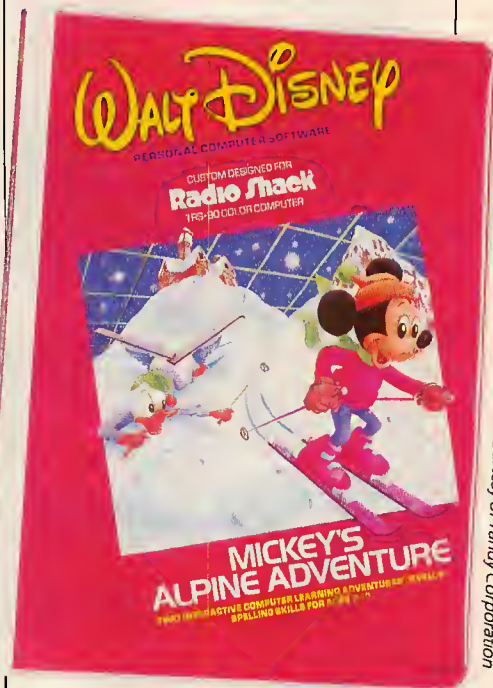
study the chart, you're not going to learn much about the subatomic world.

When your game skills improve and the structure of each atom is complete, you'll begin to learn the names of more complex elements and the contents of their molecular breakdown. If you want your child to have fun while learning, Atom will make a welcome addition to your software library.

— Richard Butt

Mickey's Alpine Adventure

Radio Shack
One Tandy Center
Fort Worth, TX 76102
(817)390-2959
\$34.95, cassette
16K



Imagine what it would be like to have a sign painter who can't spell. What would you do if you drove up to a Stop sign? This is no small problem for the people in Opple Pass, or is it Apple Pass? Apple Pass?

It all begins when Mickey and Minnie Mouse tour the Blue Mountains and hope to stop at Apple Pass for dinner. They meet the famous Tooloose Toft, a great sign painter, but not a very good speller. It seems that Tooloose has some problems with short vowels.

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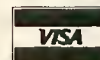
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Fortunately for Tooloose, Mickey and Minnie discover the problem before the townspeople find out.

Mickey and Minnie's adventure is one side of a two-sided program entitled "Mickey's Alpine Adventure." On the other side is a funny adventure with those favorite ducks, Donald, Huey, Dewey, and Louie. Unlike Tooloose Tofit, our ducks are having trouble spelling with long vowels. Poor Donald! He asked Louie to bring chains, coats, and meat with them on their very first ski trip. Poor Louie, he spelled those items chians, caots, and maet. You guessed it, no one knew what he wanted.

It can be fun learning more about long vowels when visiting the A and I Hardware, O and A Clothing and E and A Grocery.

Mickey's Alpine Adventure presents lessons on long and short vowels. Each side lasts approximately twenty minutes. The stories are interesting and will hold the attention of 7-to-10 year olds, the recommended audience. Beware that the letter Y is not addressed in the "sometimes" capacity in either program.

Two lesson packages are available with Mickey's Alpine Adventure, one for home use, the other for school. The only difference is packaging. The school package includes student and teacher materials while the home package includes ideas for parents to use with their children in the basic documentation.

The narration, music and graphics are all very good. (Narration is important because vowel sounds need to be clearly stated for young children.)

Each program is interactive — questions are asked, requiring student response throughout. A summary of total questions and correct responses is given at the end of the lesson. Summary questions are also asked at the end of each adventure, a good feature for reinforcement of what should have been learned.

As always with Disney, the stories are fun and wholesome. My only criticism is that the story and narration are slow. The words to the narration appear on the screen; then they are spoken by the narrator. On the other hand, the required reading by the user followed by narration could be a plus since it includes visual and auditory learning. You be the judge.

All in all I think Mickey's Alpine Adventure is a good program. It is a good follow-up to any lesson introducing vowels. Certainly a story involving Disney characters with rules on spelling and vowels is memorable.

— Paul Kimmelman

Alphabet

Childish Software

P.O. Box 985

Norcross, GA 30071

\$9.95 cassette

32K Extended Color Basic



Alphabet is a series of seven programs that will teach preschoolers and kindergartners the alphabet.

The first program shows the letters of the alphabet, in order. The screen shows a picture of something that begins with each letter, both actually and phonetically. For example, a mouse appears with the display for the letter M.

An audio tape is included with the Alphabet package. The tape plays through the speaker of the television while the child moves through the program. The child controls the speed of presentation by pressing Enter to see the next letter. While the student is looking at the letter, the audio tape is stopped to maintain synchronization.

The second program teaches the child to sing the Alphabet Song. This program also includes an audio tape.

The third program lets the child match upper- and lowercase letters. The uppercase letter is displayed, and the child must pick the correct answer from two choices. A cursor rotates between the choices — the child presses any key when the cursor is in the right place. If the child selects an incorrect answer, an unhappy face appears and a low tone sounds. If he chooses a correct answer, a high tone sounds and a piece of a happy face appears. As the student makes more

correct answers, the happy face is built, piece by piece. Lesson 3B gives the student the lowercase letter, to which he must match uppercase.

Programs 4 and 5 have the student match a picture with the first letter in its name.

Lesson 6 uses a voice generator to randomly call out letters. The student then picks the proper letter from several on the screen.

Finally, Lesson 7 displays a series of letters with one letter missing. From a group of choices, the student selects the letter to complete the series.

These activities all provide good drill and practice with the alphabet. The variety of drills grasped and held the children's attention. The programs suffer, however, from some minor technical difficulties.

It was very hard to keep the audio tape synchronized with the first lesson. I had to resynchronize the tape more than once. Lesson 2, which also used an audio presentation, had the same problem, but it was not as bad as Lesson 1.

Lesson 6 used a synthesized voice. I could barely understand what the voice was saying, though. It made a pleasant drill frustrating.

Aside from these minor difficulties, I found this series of programs delightful. The graphics are both clever and meaningful.

The programs are different enough to keep children interested, and consistent enough to provide continuity. For example, the same figures are used to illustrate letters in all programs. The same mouse is drawn in Lesson 4 and in Lesson 1. The consistency helps children learn without confusion.

Instructionally, the programs are sound. Each drills the same subject matter in a slightly different way.

The documentation covers 22 pages, and is very complete. Each program is described in detail, along with clear behavioral objectives. The documentation ends with a number of alternate activities and applications for each lesson. A parent or teacher could use these suggestions to reinforce the subject matter away from the computer. The final pages of the documentation include routine descriptions for each of the programs. Since all the drills are written in Basic, you could easily customize any or all of the lessons.

Since the programs are recorded in order on one side of the cassette, it

is easy to run one lesson, leave the tape without rewinding and just type CLOAD when ready for the next lesson. You can also save all but one of the programs to disk for faster execution. The speech synthesizer for Lesson 6 is written in machine language. The documentation doesn't list the addresses you need to copy the program to disk.

In general, I was pleased with Alphabet. It is educationally sound, easy and fun to run, and relatively free of errors.

— Norman Garrett

Criss-Cross Math

TCE Inc.

P.O. Box 2477

Gaithersburg, MD 20879

(301)963-3848

\$12.95 cassette

16K Color Basic

Criss-Cross Math uses the familiar tic-tac-toe game to provide one or two players practice in addition and subtraction. It appears to be best suited for children in grades 1 - 4.

The nine positions on the board are labeled A - I. When a letter is chosen, a problem selected at random appears with a question-mark prompt. A player gets two tries to solve the problem before the correct answer is displayed. This gives a child ample opportunities to correct an answer, and the right answer is given as feedback if missed. A correct answer places an X (or O) in the space. Of course, three in a row wins. A cumulative tally of wins appears on the last screen.

Answers are entered "backwards," from right to left (instead of left to right). This is the way we normally add or subtract on paper. Educationally, this method reinforces the concepts of place value and regrouping.

There are five levels of difficulty in Criss-Cross Math, so students won't easily tire of the game.

The documentation tells you how to load and make a back-up copy of the program.

Criss-Cross Math is best as individual practice. No means are provided for tracking progress or diagnosing problem areas. This would make the program less attractive to a teacher who needs to know how much a student has improved or what problems were missed.



1. Send a \$10 check for the demonstration cassette with programs for grading and student information. This may be all you need.
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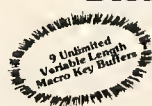
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Color Computer/27

I recommend Criss-Cross Math only as a drill and practice game. This it does well, while keeping a child's interest. A classroom teacher would likely need a more sophisticated program.

— Mark Haverstock

TESS (The Educational Software Selector)

1984 Edition

EPIE Institute

Teachers College Press

1234 Amsterdam Avenue

New York, NY 10027

593 pages

\$49.95, paperback

If you're an educator considering hardware or software purchases, invest in The Educational Software Selector (TESS). It's probably the most valuable and complete resource you'll find. Along with providing descriptive lists of educational software, TESS tells you how to evaluate your needs and make informed purchasing decisions.

TESS is a database compiled by the EPIE (Educational Products Information Exchange) Institute. EPIE recognizes that the first computer hurdle for educators is finding and sorting through the vast number of places where software is offered and advertised. This exhaustive database is their answer. It tells you succinctly what is available and for what computer system.

The lists are TESS's forte — they organize software according to subject area (aviation, business, driver education, engineering, health, industrial

arts, etc.) or system (Apple, Atari, Commodore, IBM, Monroe, Radio Shack, Texas Instruments). Know a product's name? Just check an index near the back of the book for a complete description. Suppliers are listed with addresses, phone numbers, and purchase policies.

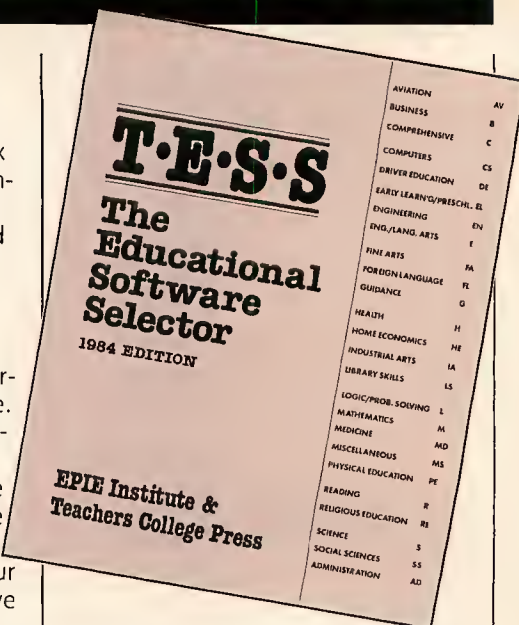
How To Use It

Each entry in the software list is organized like the sample in the Figure. As you can see, the description is exhaustive.

Compare the program type, grade level, scope, configuration, and price with your own requirements. If the criteria match, add the program to your list of potential purchases. If not, move on to the next entry.

Of the 5000 pieces of software listed in TESS, 2000 refer to reviews in other publications, along with a code for the general tone of the review (+ means favorable, — unfavorable, 0 neutral). Don't rely on these codes completely — a review may have been favorable or unfavorable for reasons unimportant to your application. The publications and their addresses are listed, so you can easily order back issues and read the reviews for yourself.

When you've made a list of potential software purchases and narrowed it down to half a dozen or so, contact the manufacturers to confirm features, system requirements, and price. You may be able to get preview copies of a piece of software, or to negotiate a special price for multiple copies or a networking copy.



If you're not sure how to choose among several tempting software packages, check out the introductory essay and the questionnaires at the back of the book. After you read TESS's "Seven Steps for Responsible Software Selection" and answer all the queries, you should be ready to make a decision. Future editions of TESS will help you choose administrative software.

TESS is a good, solid starting point for your inquiries. It belongs in every school library, right next to the other reference books. Don't request a purchase order for software listed in TESS until you've done some additional homework, though.

And remember that software companies sprout faster than crocuses in Spring. You'll probably see ads for software that's not listed in this edition of TESS, but with this solid reference behind you, you'll be able to ask the right questions of any software company.

— Lynn Rognsvoog, staff

1. **NK 9 K-8 MATH PROGRAM VOL. I** Cat. 26-1715

2. **Types:** Rote drill, skills practice. **Grades:** Kinder.-8

3. **Uses:** School; for main-line curric., remedial.

4. **Scope:** Mult. topics, mult. years. **Grouping:** Individ.

5. **Description:** Practice on four basic arithmetic operations. Has diagnostic and mastery testing. Average lesson is 15 minutes. Not copy protected, not list protected. Network version available.

6. **Configuration/Price:**

7. 1. Radio Shack TRS-80 Mod I/III/IV, 48K, 5-in. floppy disk dr., Disk BASIC, TRSDOS; on disk \$199.

8. 2. Radio Shack Color Computer, 16K, cass. recorder, tape \$199, on disk \$199.

9. 3. Radio Shack TRS-80 Mod I/III/IV, 16K, cass. recorder, BASIC; on tape \$199.

10. **Components:** 10 prog's, 5 cassettes/4 diskettes, 2 workbooks.

11. **Availability:** Radio Shack.

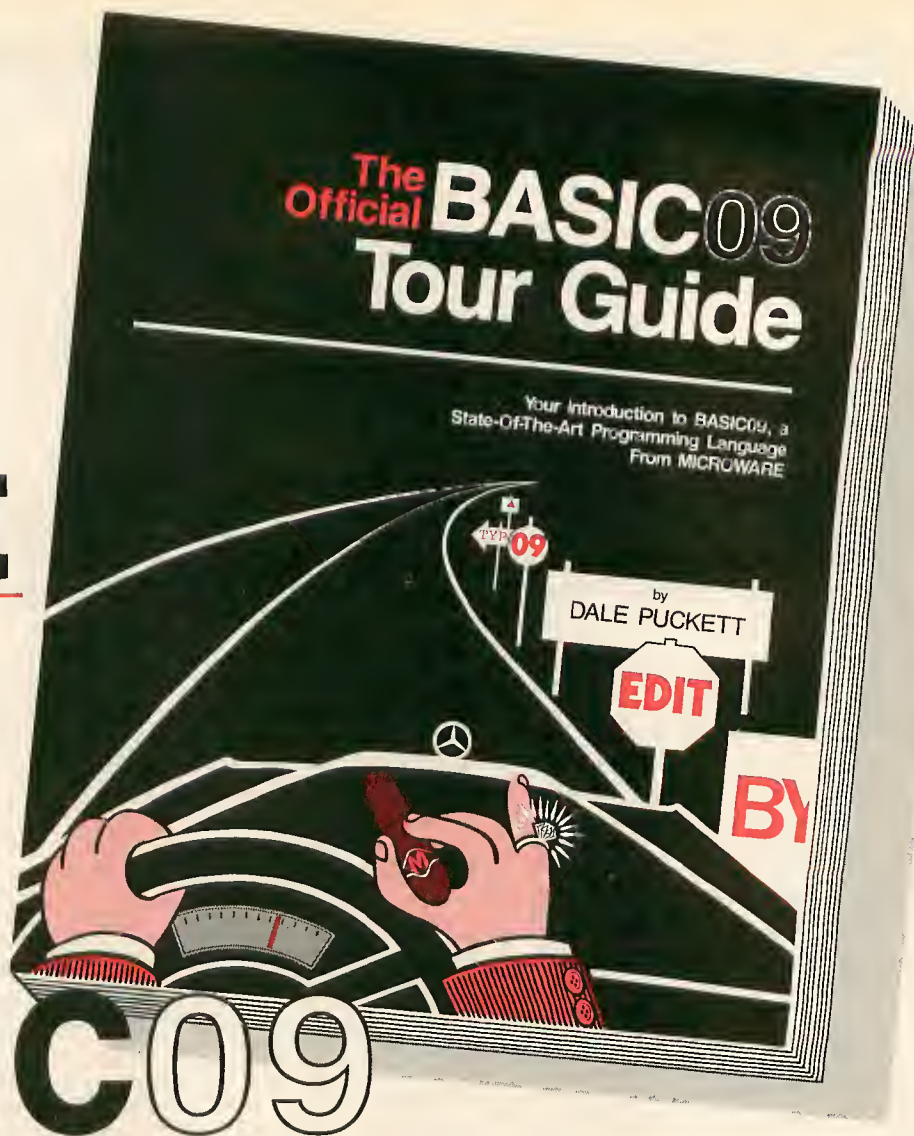
12. **Reviews:** EPIE 03/81 (+); EL 9/82 (+).

13. **User Site:** For names, contact Dr. Lee Droegemueller, Univ. of Arizona Tel: 602/626-5955

Figure. A Sample Entry in TESS

1. Name, catalog number, release date
2. Type of program
3. Grade level
4. Suggested audience
5. Number of topics and length of course
6. Group size (individuals, pairs, etc.)
7. Description and lesson length
8. Copy protection and network status
9. Minimum system configuration and price
10. Distribution medium
11. Books and disks or cassettes
12. Suppliers
13. Negative, neutral, or positive review
14. Review citation
15. Contact for more information

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Hands On!

by Children's Computer Workshop
Radio Shack
One Tandy Center
Fort Worth, TX 76102

32K
\$99, disk

Your students won't be able to keep their hands off Hands On! Educators are always looking for colorful kits to challenge their students with a combination of fun and educational experiences. Hands On! provides these and more.

Hands On! is a beginning computer experience for upper primary grade students. It is education oriented, not a video arcade type of game. Inside its storage box is found an instruction book (teacher's manual) and two learning modules, "Blackboard" and "Color It." Each module contains reproducible worksheets, sturdy activity cards, an activity and a class disk, board games, and suggested educational activities. These well-documented modules come complete with notes on educational objectives, ideas for educational applications, teaching extensions, and an easy-to-understand computer glossary.

The manual provides clear general information, especially regarding disk use. The manual did *not* advise me to make a back-up disk. I did, however, and had no trouble using the Radio Shack DOS back-up procedure. I suggest you make a copy of the class disk once you have entered the data.

The producers of Hands On! have not write-protected their disks. You should! Again, the Radio Shack DOS procedure helped me: I inadvertently began to put my class list on the activity disk. Fortunately, one of the very fine features of this kit is a routine to fix such errors — like the screen prompt that told me I had inserted the wrong disk!

Blackboard

Blackboard is a daring language arts-based computer learning activity which will launch your students into the galaxy of computer use and careers. It introduces or reinforces the primary concepts of word processing, computer sorting and filing, and electronic mail.

The manual includes a set of directions easily followed by even the computer novice. This section of the book, supplemented by the timely screen prompts, increases Blackboard's fun and educational format.

The Learning Manager for Blackboard lets you place up to forty students on one of the three individualized computer skill levels. You can modify or review this list. You may give some students the option to save their blackboard(s) on an individual disk, as well as on the class disk (storage disk provided in the kit).

For this activity the keyboard is to be used like a typewriter. A piece of colored "chalk" (a flat cursor) underscores the space where the next character will appear on the screen. You can see each character appear on the screen as it is typed. It may require some time for your learners to locate the correct key. This would be a good time for you to supplement Hands On! with a keyboarding lesson or program.

Your students can make the "chalk" change to one of six colors. Using this ability, your students can create a colorful screen. Some word processing skills and concepts are practiced as they maneuver the "chalk" around the screen. They can also erase one space or the entire blackboard. A beep sounds with each movement.

Level one is the most basic: students type on or edit only one screen. They do not have the option to save their text or to share it.

Level two users may type on or edit up to six blackboards. They can also choose to title or save their boards. The directions for applying these added options are conveniently displayed on the screen.

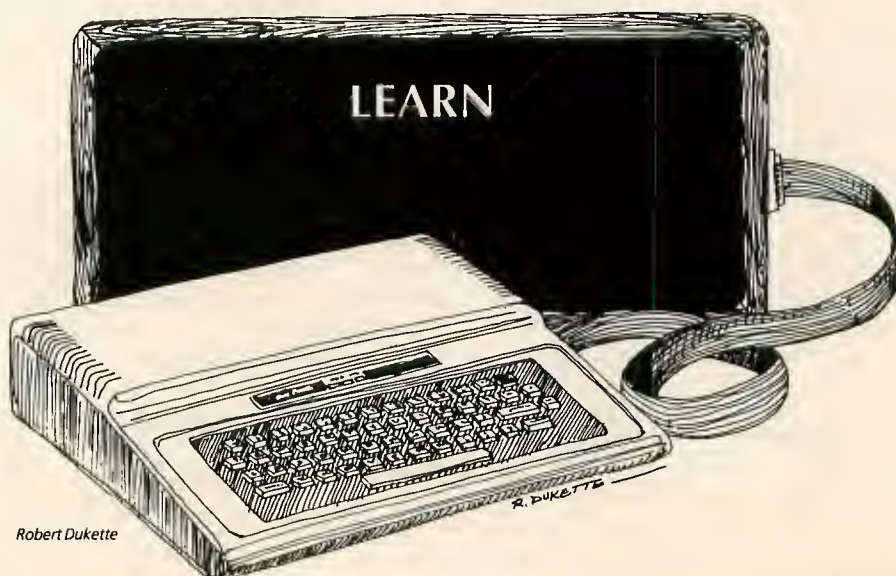
Level three students are allowed to type on, edit, save, title plus recall and share up to six boards. Once the students have mastered this level, they may be ready for a simple word processor.

**"Your students
won't be able
to keep their hands off
Hands On!"**

I was initially discouraged by the seemingly limited writing area available on each blackboard (eight columns, 15 to 21 spaces per line depending upon character size, and 120 to 168 spaces per board depending upon character size). But it proved sufficient; don't expect your students to write a lengthy novelette.

You will discover the manual's Teaching Extensions make these learning modules enjoyable and easy to apply. Each set of suggested activities includes its own educational objective, coordinated with a reproducible worksheet.

Durable and colorful Activity Cards come complete with educational activity ideas, a materials list, and directions for using the cards. The "How To Play Blackboard" reference card lets you use the activity without having to constantly refer to the manual.



Robert Dukette

And there's more! A board game (included in the kit) reinforces the computer game's educational goals. I suggest you protect the paper board and paper cards so you or your students can play often. You will want to review and familiarize yourself with the rules and directions of this part of the module prior to its use.

Color It

Color It is the second learning module in this kit. This easily-used computer learning activity unleashes the artist in everyone, through the challenge of computer graphics lessons. I found lower elementary students eager to use it.

Your students will learn how important the location of the place finder (blinking cursor) is on the screen. They can control the place finder movement by depressing the appropriate Left, Right, Down, or Up Arrow key. By experimenting with these keys students will discover they can achieve diagonal movement by pressing one horizontal and one vertical key simultaneously.

Students may select the shape, texture, color, and directional movement of the place finder. These attributes can be altered at any moment and the computer will instantly remix the selections. The drawing options are displayed in a set of boxes at the bottom of the screen. The first box shows the available color/texture choices when the user depresses the c key. This can be repeated until the desired choice appears on the screen in the "color puddle" above the graphic letter C.

The shape of the place finder on the screen (the second box) can be changed by depressing the s key, also repeated until the desired shape appears.

Many second graders using this program quickly realized that the third box depicts a pen off the line ("paper"). In this position the place finder cannot draw any image on the screen. When the picture of the pen shows it in contact with the line, the place finder will draw on the screen. The position of the pen will change when the p key is depressed.

The speed of the place finder's movement across the screen can be reversed by depressing the m key. The picture of the turtle above the graphic M stands for slow movement of the line across the screen. The picture of the rabbit is easily understood to mean fast movement.

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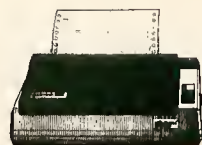
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Color Computer/31

Anxious or timid users can erase their screen to begin again by depressing the C key until the "color puddle" is black. Next the Shift key and then the Clear key *should be depressed*; the picture will seem to shatter as it blends with the background.

My advanced students called upon the additional fun functions offered only in levels two and three of Color It. By depressing the F key they could alter the location of a picture on the screen or change its color. These features were fun but they also proved confusing to students with perceptual difficulties.

The Learning Manager which augments Color It offers individualized instruction by letting you create and edit class lists (up to 40 students) or read class summaries. The computer will automatically alphabetize and sort your class list for you. Level three is distinguished from level two by the ability to save and share creations.

You and your students will profit from the many teaching extensions suggested to supplement Color It. These ideas, like those in Blackboard, include educational objectives, related

activities, and a set of reproducible worksheets.

The Activity Cards for Color It are also easy to use. They suggest several creative ideas which will amplify the module's educational goals. A list of all the materials needed to implement these activities is included.

**"The students
using this kit
were able to play easily
and they learned
quickly."**

The game board further extends the flexibility of Color It, and reinforces the educational goals of this learning module. You will find the directions for the game, game rules, and other suggestions in the manual.

I found the repetitive task of creating or working with the class lists the most time-consuming aspect of these modules. However, the students using this

kit were able to play easily and they learned quickly. They discovered the logical letter/picture association and book/screen directions to be very helpful.

Hands On! is most valuable for upper primary grade levels. Although upper grade elementary students showed initial interest, they quickly became bored. My congratulations to Radio Shack and the Children's Computer Workshop for providing such a worthwhile computer activity for younger learners.

— John P. Smith

Mix and Match

TCE Inc.

P.O. Box 2477

Gaithersburg, MD 20879

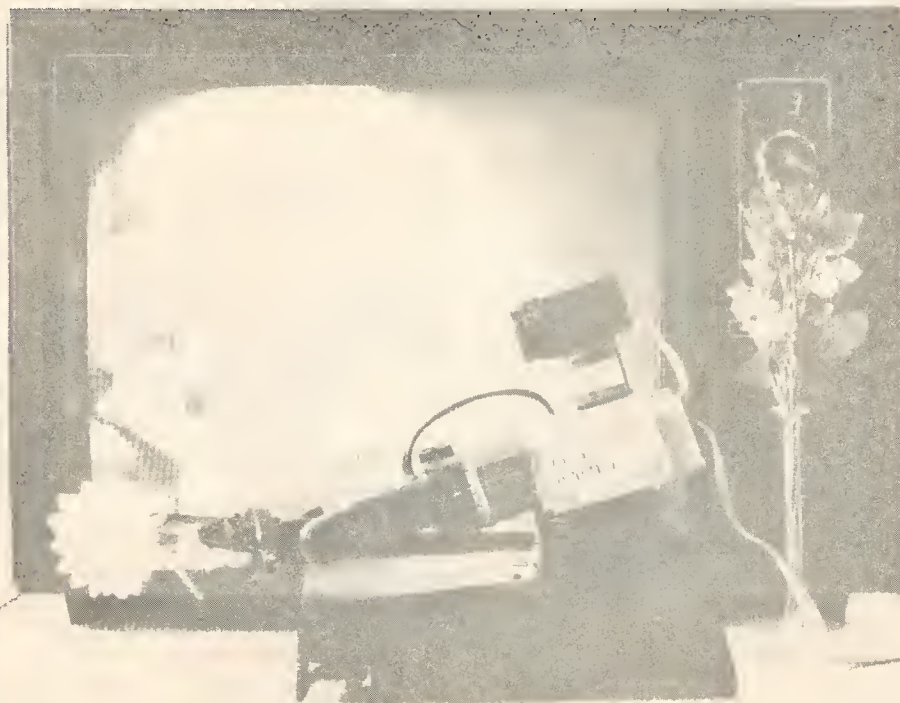
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\$16.95 cassette

16K Color Basic

Mix and Match is a memory game — you must match hidden pairs of shapes or pictures (like the game Concentration). It's not an original con-

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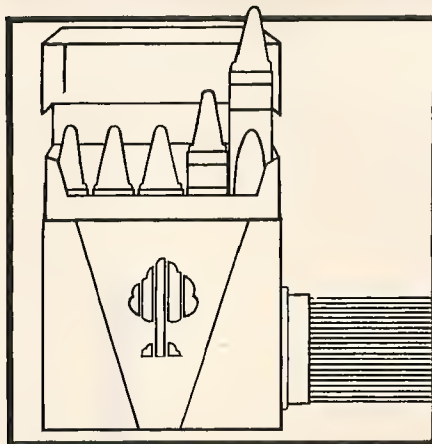
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cept, but Mix and Match is uncomplicated and straightforward. A young child can play with minimal parental direction.

Twelve small squares labeled A – L appear on the screen. To play, you press one letter choice and then another, revealing the hidden low-resolution graphic drawings. If the drawings match, you're rewarded by a strobing color border and musical tones. The game continues until you've matched all pairs.

Mix and Match is not advertised for any particular age group. However, it appears to be most appropriate for pre-school through first grade. Uppercase letter recognition, as well as some shape discrimination, is a prerequisite. Older children may find this program overly repetitious, as there is only a limited set of pictures available. I'd like to see more levels of difficulty incorporated into the program.

If you are operating a 16K Extended Color Basic system, take note: You must enter PCLEAR 1 before loading or an OM error will appear. The program requires a few more bytes than are



available upon normal ECB start up, so the reserved graphics pages in RAM must be cleared.

The documentation is short, but adequate. Included are loading and back-up instructions for the non-copy-protected tape. This program can also be backed-up on disk without problems.

Mix and Match is a simple memory game for early learners at a fairly reasonable price. It would be an even better value if more levels of difficulty were available within the program.

— Mark Haverstock

The Solar System

Radio Shack
One Tandy Center
Fort Worth, Tx 76102
\$59.95, cassette

Was Pluto discovered on January 23, 1930, February 8, 1930, or March 13, 1930? Who discovered Pluto? How was Pluto discovered? You'll be able to answer these questions and many others after working through The Solar System.

The Solar System is a talk-tutor program that teaches about the planets in our solar system. The program gives background information on each planet, graphic representations, astronomical symbols, and some interesting facts both on the screen and on the accompanying audio tape. For instance, Uranus was discovered in 1781, almost 150 years before Pluto.

The planet Pluto and its discovery are featured in The Solar System. The narrator of these sections is Dr. Clyde Tombaugh, the astronomer who discovered Pluto. It is exciting to hear Dr.

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Tombaugh talk about his work — and it makes students aware that famous scientists are real people.

Other parts of The Solar System's narration are a bit fast, especially for younger learners.

The Solar System asks questions to which the user responds by pressing the number of the correct answer. A summary of correct responses is given at the end of the program.

An attractive wall poster and a hard-cover book on Pluto by Tombaugh and astronomer Patrick Moore are included with the package. The book is a good resource for any students intrigued by the planet Pluto.

Like a good video tape, a talk-tutor program probably won't be used many times. Parents may not want to make the relatively large investment in a program their children will run only two or three times. Schools and libraries on the other hand, will find the program extremely economical. Each new school year will bring new groups of children to see this program in action. The packaging is durable and the program interesting — it can be used over and over.

The Solar System runs for approximately 30 minutes. The book and poster enhance its educational value, and Dr. Tombaugh's narration makes the discussion of Pluto's discovery more relevant. The discussion of the other planets makes this program an interesting lesson on the total solar system.

— Paul Kimmelman

Mathfact

B5 Software
1024 Bainbridge Pl.
Columbus, OH 43228
16K Extended Color Basic
\$16.95 cassette, \$18.95 disk

Mathfact will help first- to fifth-graders learn addition, subtraction, multiplication and division.

Mathfact has two levels. The first displays math problems along with counting blocks. The result looks like Figure 1. Level 2 presents problems only, without counting blocks. If you enter a wrong answer in Level 2, the problem appears again with counting blocks.

Response time is measured at both levels, but correct responses are tallied only in Level 2. Level 1 is the remedial level, while Level 2 is for reinforcement of concepts previously learned, with remediation only when a question is missed.

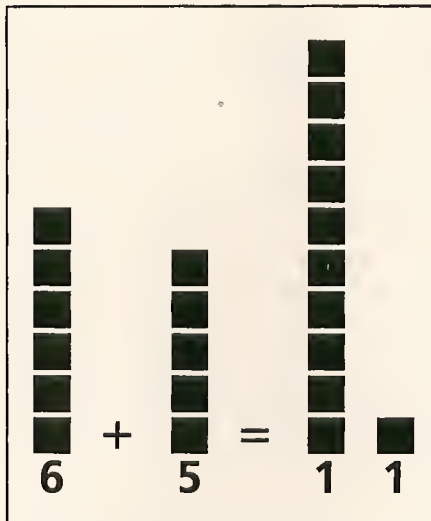


Figure 1. Counting with Blocks

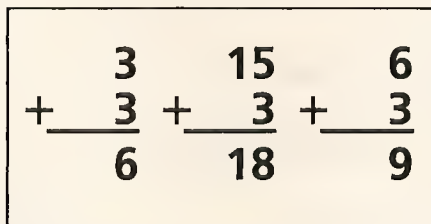


Figure 2. Level 2 Addition

After getting 100% correct in Level 2, or after finishing Level 1, the student is allowed to play a number-guessing game. The child must guess a number in a given range within four tries. I had a hard time with this game — it's not a pushover.

A student who just wants to play the game can be assured of that opportunity by always selecting Level 1. Smart kids will figure this out quickly — I wish the program "locked out" Level 1 when a student went through it once correctly.

Program Strengths

The counting block idea in Level 1 is good, as it will supplement number theory and place value instruction. The sequence of instruction is controlled by the student, a good feature for drill and practice software, since not all students need work in the same areas.

The vertical problem format of Level 2 is normal and realistic. All too often, problems are shown in linear form, something the student has not seen before.

Program Weaknesses

Although instructional objectives are alluded to in the documentation, those objectives are not clearly stated anywhere. It is difficult to judge whether a program meets its objectives if the objectives themselves are not clear.

Documentation is sparse, and on-line documentation does not always correspond with written documentation. For example, the "A" option for selecting a mixture of addends does not appear on the menu but is mentioned in the booklet.

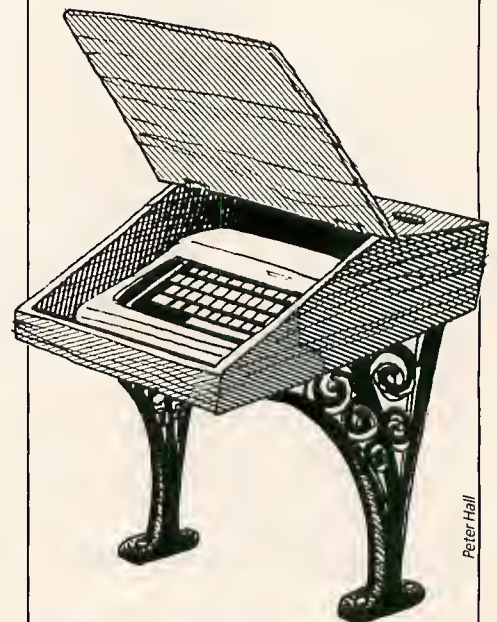
Recommendations

Mathfact is an adequate drill and practice program. It does not instruct, but can be used for remediation and reinforcement of previously-learned concepts. It is best used by individual students, rather than by a group.

I suggest several improvements for future releases:

- Include specific instructional objectives at the beginning of the documentation.
- Correlate on-line and written documentation and menus.
- Improve the reward game, especially for first and second graders.

— Norman Garrett





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So, I've put together the Color Burner, an EPROM programmer that will burn all the "27" family — 2716, 2732, 2764, 27128. Yes, it will also burn 68764 replacements for your Basic ROMs and, no, it won't break your budget.

Although my Color Burner doesn't cost a whole lot, you won't get burned over quality. I don't cut corners in hardware. I use the best fiberglass boards, with gold edges, protective solder masking and silk-screened legends. Before I send you a Color Burner, I test it by actually programming an EPROM.

So how can it be good if it's so inexpensive? First of all, you can only get a Color Burner from Green Mountain Micro. No dealers are adding to its price. Second, it isn't fancy. No high-tech power supplies are in sight. You've got to add three homely, low-tech 9-volt batteries to get it

going. Finally, it won't set new standards of complexity. It's simple, hardworking and reliable.

You can get your Color Burner complete or *a la carte*: try an assembled and tested unit, a kit, or just a bare board. Order it with or without programming software. Both kits and assembled units come with over 40 pages of documentation, complete program listings, and schematics. Nothing is hidden.

You'll burn those EPROMs, you won't get burned, and my technical support staff will keep you from getting burned up if you have a question or need help.

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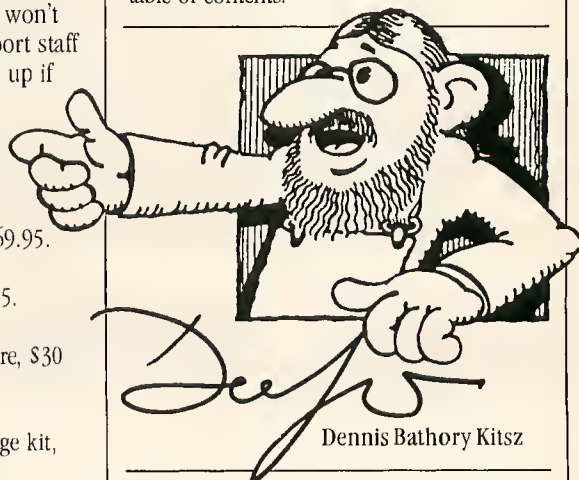
- Assembled/tested with software, \$69.95.
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Programs 24/28-pin EPROMs, providing 21/25-volt programming pulses under software control. Includes unwired personality module. Requires three 9-volt batteries (not included). Tape software supports 2716 through 27128 and 68764/66 EPROM families, and requires 32/64K Extended Color Basic.

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"... Nearly every feature and option possible to implement on the Color Computer. The design of the program is excellent; the programming is flawless... Features for the professional, yet it is easy enough for newcomers to master... Certainly one of the best word processors available for any computer..." October 1983 "Rainbow"

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By Bill Argyros

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32K DISK ONLY \$39.95

Lowercase displays not available with this program.



VIP Calc™

(Formerly Super "Color" Calc)

By Kevin Herrboldt

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Both versions feature Tape save and load, but the disk version also has the Mini Disk Operating System of the entire **Library**.

32K (Comes with tape & disk) \$59.95

32K does have hi-res displays, sort or edit.

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VIP Terminal™

(Formerly Super "Color" Terminal)

RATED BEST IN JANUARY 1984 "RAINBOW"

By Dan Nelson

From your home or office you can join the communication revolution. The **VIP Terminal™** opens the world to you. You can monitor your investments with the Dow Jones Information Service, or broaden your horizons with The Source or CompuServe, bulletin boards, other computers, even the mainframe at work.

For your important communication needs you've got to go beyond software that only lets you chat. You need a smart terminal so that you can send and receive programs, messages, even other **VIP Library™** files. **VIP Terminal™** has "more features than communications software for CP/M, IBM and CP/M 86 computers." Herb Friedman, Radio Electronics, February 1984.

FEATURES: Choice of 8 hi-res lowercase displays * Memory-Sense with BANK SWITCHING for full use of workspace * Selectively print data at baud rates from 110 to 9600 * Full 128 character ASCII keyboard * Automatic graphic mode * Word mode (word wrap) for unbroken words * Send and receive Library files, Machine Language & BASIC programs * Set communications baud rate from 110 to 9600, Duplex: Half/Full/Echo, Word length: 7 or 8, Parity: Odd/Even or None, Stop Bits: 1-9 * Local linefeeds to screen * Save and load ASCII files, Machine Code & BASIC programs * Lowercase masking * 10 Keystroke Multiplier (MACRO) buffers to perform repetitive pre-entry log-on tasks and send short messages * Programmable prompt or delay for send next line * Selectable character trapping * Send up to ten short messages (KSMs), each up to 255 characters long, automatically, to save money when calling long distance.

All versions allow tape load and save of files and KSMs, but the disk version also has the Mini Disk Operating System common to the Library.

32K (Comes with tape & disk) \$49.95

(Tape comes in 16K but without hi-res displays)

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ARE ENCOURAGED.**

VIP Database™

(Formerly Super "Color" Database)

INCLUDES MAIL MERGE CAPABILITIES TOO!

By Tim Nelson

This high speed MACHINE LANGUAGE program fills all your information management needs, be they for your business or home. And it does so better than any other database program for the Color Computer, featuring machine code, lowercase screens and mailmerge capabilities. Inventory, accounts, mailing lists, family histories, you name it, the **VIP Database™** will keep track of all your data, and it will merge **VIP Writer™** files.

The **VIP Database™** features the Library Memory Sense with BANK SWITCHING and selectable lowercase displays for maximum utility. It will handle as many records as fit on your disk or disks. It is structured in a simple and easy to understand menu system with full prompting for easy operation. Your data is stored in records of your own design. All files are fully indexed for speed and efficiency. Full sort of records is provided for easy listing of names, figures, addresses, etc., in ascending or descending alphabetic or numeric order. Records can be searched for specific entries, using multiple search criteria. With database form merge you may also combine files, sort and print mailing lists, print "boiler plate" documents, address envelopes - the list is endless. The math package even performs arithmetic operations and updates other fields. Create files compatible with the **VIP Writer™** and **VIP Terminal™**. Unlimited print format and report generation with the ability to imbed control codes for use with all printers.

As with all other Library programs, the Database features the powerful Mini Disk Operating System.

32K DISK \$59.95

64K Required for math package & mail merge

VIP Disk-ZAP™

(Formerly Super "Color" Disk-ZAP)

RAVED ABOUT IN THE APRIL 1983 "RAINBOW!"

By Tim Nelson

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16K DISK \$49.95

Lowercase displays not available with this program.



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HOME & BUSINESS MANAGEMENT



Where does your Color Computer shine most?
Helping solve daily problems, of course — and nothing is more daily
than our home and business management. Monetary manipulations are
becoming more and more complex as time rolls on. Fortunately, there are
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figure annuities, do taxes, organize funds, process information —
you name it!

MONEY

Dyfin

Dynamic Electronics Inc.
P.O. Box 896
Hartselle, AL 35640
(205)773-2758
\$19.95 cassette

Dynamic Electronics has a financial program that will help you plan loans, savings, annuities, investments, and retirement. Also included in the package is a calendar function and a routine to help balance your checkbook.

There are ten functions in the main menu: Addem, Annuity, Calendar, Interest, Loans, Obtain, Return, Save, Withdraw, and To Intro.

Addem is a very simple (emphasize simple) adding-machine function (no multiplication and no division). You will probably find that you can add and subtract faster in your head.

The Calendar function produces two types of calendars: the day of the week, and a full month. There is a problem with this program: If you want to get a year before 1900 you must subtract the year from 1900 and then enter the number of years with a minus sign. (The year 1890 is written as - 10.) The reverse is true for years after 1999. (The year 2233 is written as 333.)

The function, To Intro, restarts the program with the self-documentation portion. This is handy if you want to look up what a particular function does. However, there is no End Program function. The only way to stop the program is to press the Break key or shut the computer off.

The remaining seven functions can be very helpful in planning your financial future. However, these functions don't supply all the information that you might expect.

Annuity is an example. This function calculates the value of a savings account with regular deposits. What it shows is the value at the end of the period. It really should show each deposit, interest, and total after each deposit.

There is one more major problem with this program. Any financial program worth its salt has a print routine built-in. This program has none. If you don't write the information down, it's lost after you shut the computer off.

Would this program be a good buy? Well, if you were studying business math in school, the program might be of some value. However, for use around the home or in a business application, the limited amount of information produced and the lack of any print routine should make you pause before committing \$19.95.

—Bob Jack

Loan Payment Calculator

Elite Software
Box 11224
Pittsburgh, PA 15238
(412)795-8492
\$19.95 tape, \$22.95 disk

Are you considering a major purchase, such as a stereo or a car? Loan Payment Calculator may be just what you need to make the best financial deal.

Loan Payment Calculator is a simple program that does one thing. It calculates the monthly payment on a loan.



The program is so easy to use that anyone should master it the first time used.

The program screen displays these seven lines:

```
1 AMOUNT OF LOAN ($): 10000
2 INTEREST RATE (%): 14
3 TERM OF LOAN (MOS): 48
4 PRINT RESULTS
5 EXIT PROGRAM
>>MONTHLY PAYMENT IS: $273.26
SELECT #?
```

This is the monthly payment for a \$10,000 loan at 14 percent interest for 48 months.

To use the program, enter the line number of the value that you want to change (1, 2 or 3). A prompt, CHANGE TO? appears. Enter the figure that applies to your situation. The monthly payment line automatically updates after each entry, so you can quickly see the effects of different values.

Sound easy? It is, but there are a few restrictions. Loan Payment Calculator is fussy about what you type. For Amount of Loan, use any value less than 1,000,000 and do not use the dollar sign or commas when entering the amount. For Interest Rate to work properly, enter the Annual Percentage Rate (APR) without the percent sign — enter 12.3 for 12.3 percent. For Term of Loan, enter the number of months, not years.

The Break and Reset keys are live, so pushing either will drop you out of the program. Also, be careful not to push the Clear key. Doing so results in a blank screen. Pushing Enter restores the values, but not the descriptions for each line. The only cure that I could find is to Break and then type GOTO 110.

Loan Payment Calculator has an option to copy the display to your printer. You may have to make a change in the program, first, though. The instructions incorrectly state that Loan Payment Calculator sets up your computer to print at 600 baud. The program I received actually sets up the computer for 2400 baud. If your printer can't handle 2400 baud, change the 18 in Line 90 to 87 for 600 baud, or

1983 unit sales	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Average	Best	Worst
Bach	136	139	119	161	130	104	84	121	95	115	75	161	1440	140	161	75
Chalone	120	170	152	170	182	102	89	157	162	129	64	158			182	64
Dolan	188	157	103	112	161	122	99	145	145	103					188	97
Feagan	105	94	127	115	157	97	61	132	113						174	61
Graham	135	135	183	116	151	104	86	149							183	63
Harpel	134	102	190	161	180	85										
Jordan	105	109	188	171	120											
Latour	112	128	124	129												
Lucido	158	110														
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Schaeferle																
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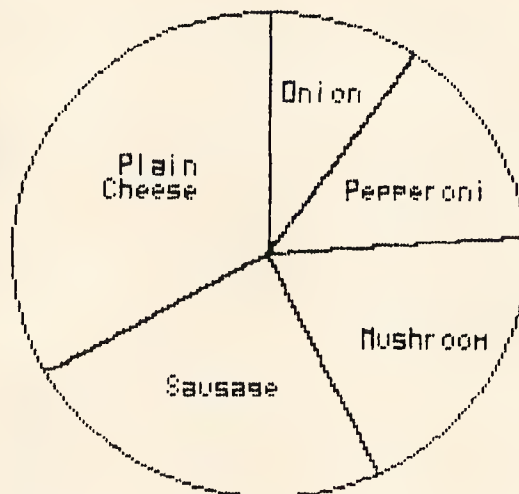


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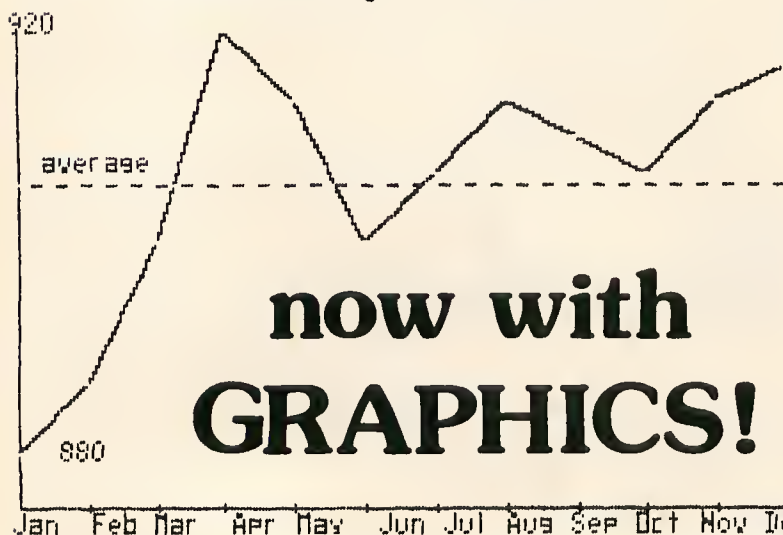
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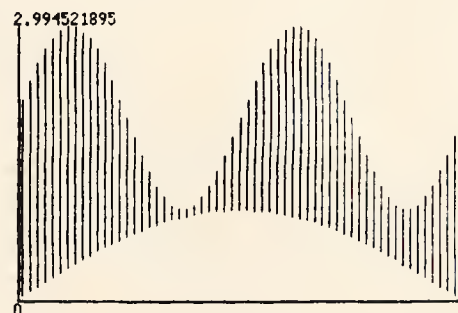
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41 for 1200 baud. If your printer can accept 600 baud, just deleting Line 90 is probably the simplest cure.

The last menu selection is 5, Exit Program. Don't use this until you are sure that you are finished. This command causes a warm start and wipes out the program. If you aren't done, the only recourse is to reload the program.

Instructions are furnished on a single page that provides all of the information needed to use the program. Everything is clearly explained and easy to understand.

Loan Payment Calculator is a short program, but it does what it is intended to do with no fuss. The price is a bit steep at \$19.95.

— Gary W. Clemens

Fundgraf

Parsons Software
118 Woodshire Drive
Parkersburg, WV 26101
16/32K Extended Basic
One Disk Drive
\$69.95 disk

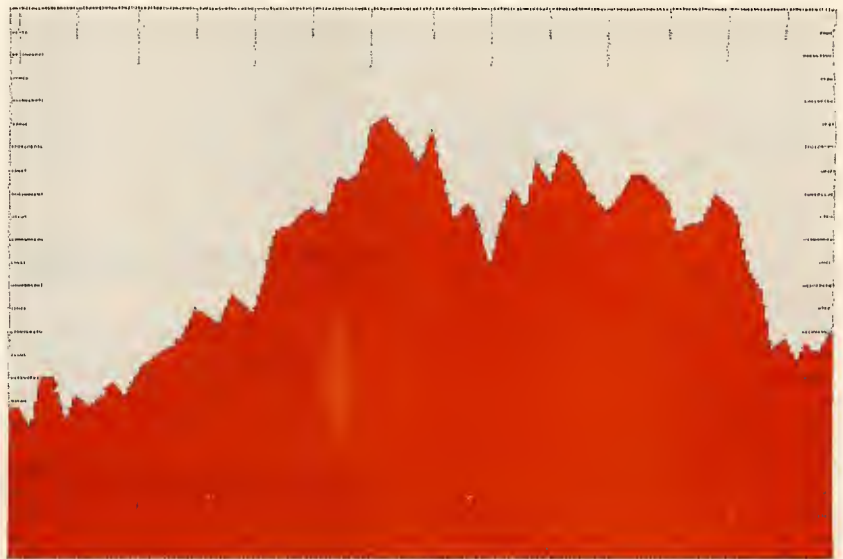
If you invest in mutual funds or stocks, Fundgraf can be worth its weight in gold. It does more than just draw pretty graphs on your screen. The market trading techniques that you use following figures and signals generated by the system can make you money. More importantly, they can keep you from losing your shirt.

The Fundgraf system consists of a main program and seven subprograms. The operational programs are as follows:

ADD-DATA is used to add new prices or change an old price for any fund or security in the file. A menu gives you the option of just adding or changing one price, or updating all of the prices. You also use this program to input dividends paid.

SHORTGRAF will plot a graph of any group of four stocks or funds in the files for up to seventy weeks out of the possible 200 in the file. With this program you can superimpose a moving average for any number of weeks you choose. Or, you can superimpose an annual percentage growth rate for any issue in the file.

This is very important in comparing two or more funds. That is, assume



Fundgraf Graph

that the program has drawn a graph of mutual fund A on the screen. The program vertically scales the graph to fit the data for that fund. Now you want to superimpose a graph of mutual fund B's data on the same screen for comparison. Although the data for fund B might cover a much broader range than A's, it will be drawn to the scale set up for A. By generating the annual growth rate for each fund, the program will provide a much more accurate comparison of the performance of the two funds.

LONGGRAF creates graphs for up to 200 weeks for any two funds in the file. The moving average and annual growth rate lines can be generated as they are in SHORTGRAF.

The graphs drawn by both LONGGRAF and SHORTGRAF have a series of long and short lines on the horizontal axis representing spans of five and 10 weeks. The vertical axis is also delineated but the scale changes with each fund plotted. That is, it does not start with zero but is adjusted by the computer to spread the price action of that particular fund over the full size of the chart. No text is drawn on the screen, so you have to remember which fund it is. This is the area where Parsons Software could make the biggest improvement.

MOVG-AVG calculates and prints on the screen or printer the moving average buy and sell signals that are generated by the crossover of price and moving average lines.

PRINTOUT creates a hard copy of price data in the files, either raw or

adjusted for dividends. Its most important function, though, is to print a table of the percent change in the adjusted price for all funds for any four periods of time in a 70-week span. For instance, the table could be set up to list the percentage change that all of the funds in the file have experienced for, say, four weeks, 13 weeks, 39 weeks, and 69 weeks. With this table it is possible to compare the price action of funds during periods of up and down markets.

SHIFDAT allows you to move data from one file to another. It actually replaces the data in the second file data from the first file so perform this routine on a back-up disk.

ADD-NAME is used to add additional issues to the file. When this is done, the computer automatically dates the file for the 5-year period of January 3, 1980 to December 27, 1984. These dates are Thursdays (except when Thursday falls on a holiday). If you wish to enter prices for new funds or stocks as of a different day of the week, the documentation provides the necessary program changes.

Miscellaneous

The system disk contains the price and dividend history on the Dow Jones Industrial Average, the Dow Jones Transportation Average, the interest rate on a money-market fund, and 29 mutual funds. Quite a bit of that history

is for over four years, but the periods are not all the same. Group A starts January 3, 1980 while group H starts April 30, 1981.

The system can be run on either one or two drives and the documentation describes the procedures for going either way. The principal advantage of running it as a two-drive system is the increase in the number of funds you can track at one time on one disk (52). One drive contains just the programs and the other drive will have the data files. With the programs and files on one disk, you will have room for 36 funds.

The program disk that you receive is not protected and you can make as many back-ups as you please. The programs are all written in Basic, which is both a strength and a weakness. The strength is that you can modify the programs. The weakness is that programs that have to massage a lot of data are as slow as the seven-year itch. The table of the percentage changes in all funds that can be produced as part of the PRINTOUT program takes about nine minutes, and not because of printer time.

The documentation, consisting of 26 type-written 8½ by 11 pages plus a 2-page table of contents, is first-class. Each program is thoroughly described and the trickier parts usually have examples demonstrating their use. All programs are menu-driven and the documentation displays the menus as they appear on the screen.

"Fundgraf can be worth its weight in gold."

Although the system can be run on a 16K computer, the documentation warns that the programs are rather long for 16K and you must type CLEAR 200 and Enter, and PCLEAR 1 (or PCLEAR 2 for SHORTGRAF or LONGGRAF) and Enter before loading.

Four supplemental programs can be purchased at additional cost (any one for \$10, any two for \$18, any three for \$23, and all four for \$27). The four are:

- **Redate** — An operational program which deletes the first year's data (52 weeks) from all the groups on the data disk and reformats the files with an additional 52 weeks. This one is essential at the end of the year.

- **Rating** — An operational program which calculates and prints a strength rating of all funds, stocks, or indices on a data file disk. (Requires an 80-column printer.)

- **Oscillog** — The price action of any fund for a 32-week period. It helps define the crossover points and anticipate a future change in the direction of the price trend.

- **Graf-Prt** — Gives a one-page printed-out copy of the graph of any fund in the data files for a 52-week period with two moving averages, a table of the moving average values for the most recent five weeks, and the buy and sell signals occurring during those five weeks. This program requires that you have a graphic screen print program. Parsons does not sell such a program but recommends the one sold by Custom Software Engineering, Inc. of Cocoa Beach, FL.

— Sam Clarke

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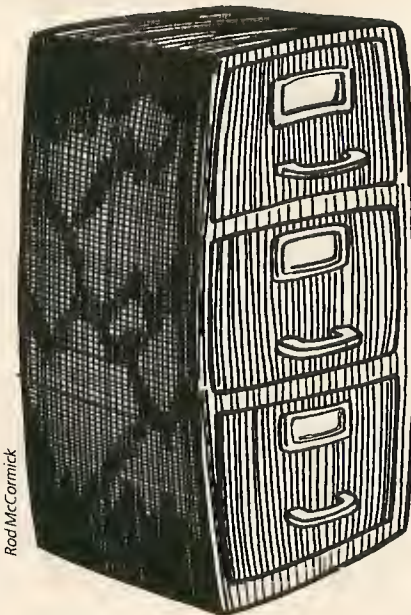
Fundfile

Parsons Software
118 Woodshire Drive
Parkersburg, WV 26101
16/32K Extended Color Basic.
\$37.95, disk

Do you have a portfolio of five or more mutual funds? Do you reinvest all the dividends and capital gains distributions? If so, Fundfile will make your record-keeping much easier.

The Fundfile system consists of a main program and four (three only with the 16K version) operational programs. The operational programs can be entered through the main program or loaded directly.

The programs are menu-driven and easy to follow if you understand mutual fund accounting and terminology. But don't think you can just sit down and start entering data. A sample transaction history for four funds is on the disk and the documentation takes you through a tutorial for each operational program using those four funds. You can waste a lot of time correcting er-



Rod McCormick

roneous entries, so use this tutorial first.

When you are ready to start setting up your own accounts, the documentation tells you how to create a new disk with your name and account information.

The first operational account is Fund-Rec which is a program for entering and recording data in the files on the disk. The program allows you to enter the following transactions:

1. Purchase
2. Sale
3. Dividend reinvestment
4. Stock dividend
5. Deposit
6. Withdrawal
7. Dividend credit (cash)
8. Interest credit
9. Interest debit
10. Dividend debit

Items 5 through 10 cover a concept that was difficult for me to keep straight: Each account can have cash in it. I am used to keeping my cash records as part of my checking accounts, separate from my securities holding account. The Fundfile accounts assume that you will have cash in the account. It is as though the account is held at a stockbroker's office and cash left to accumulate.

The next two programs, Fund-Rpt and Fund-Scr, are basically the same.

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The main difference is that the second generates the reports on the screen and the first generates the reports to an 80-column printer.

Both programs produce the following reports: calculate current value of the entire account, the data and market value for a single issue, and the data history for the entire account.

In addition, Fund-Scr produces a histogram (bar graph) of the current dollar value of each of the securities in the account. Fund-Rpt produces a balance sheet between any two dates of your choice (the 32K version only).

A trip through Fund-Scr will demonstrate the many fine reports that the system generates. The main menu consists of the following options:

- 1 — Calculate current value of the whole account.
- 2 — Review data of a selected fund or stock file.
- 3 — Review all historical data for the account.
- 4 — End the program.

If you enter Option 1, the program asks you to enter the current date as a six-digit number (840401 for April 1, 1984). The screen will show the account identification at the top, and the name of the first fund with the columnar headings \$/SHARE, #SHARES, and Cur \$ Val. You are asked to enter the price per share on the date that you entered above. Prices are entered in decimal form and you do not use the dollar sign.

The computer circles through this routine until the current price has been entered for each fund. Then it calculates and prints the valuation of the entire account.

Hit any key and the next screen shows an operating statement for the entire account with the following items:

Net Dividend Income
Net Interest Income
Total Net Income
Realized Gains from Transactions
Unrealized Gains
Total Realized and Unrealized Capital Gains

Hitting any key will take you to the next screen, the histogram. In order for the bars to make any sense (if you have one fund worth \$10,000 and one worth \$1,200) the graph must be scaled to show them both. You can circle through this routine trying dif-

ferent scales as many times as you wish.

**“Fundfile
may be overkill
for the casual investor,
but the serious
stock-market fiend
will love it.”**

Entering Option 2 (Review data of a selected fund or stock file) from the main menu brings up a list of the securities in the file and asks you to select the one to be reviewed. The computer will ask you to enter the current price and date. When you have entered that information, hitting any key will bring up a submenu that really demonstrates the reporting and accounting power of the system.

- 1 — List All Transactions
- 2 — List Purchases on Screen
- 3 — List Current Holdings
- 4 — List Completed Sales
- 5 — List Dividend Payments

Entering any of the options will bring up a new screen with clear headings and totals of all pertinent information. For example, the totals shown at the end of the report generated by Option 1 are:

Total Long Term Capital Gains
Total Short Term Capital Gains
Total Realized Capital Gains
Total Unrealized Capital Gains
Current Holdings
Number of Shares
Price Per Share
Current Value

The reports produced by any of the options present a similar abundance of information.

Although the Fund-Rpt program gives generally the same reports as Fund-Scr, the notable exception is the Balance Sheet Report. This report prints two balance sheets, one for the beginning of a period, and one for the end of the period with notations of the differences between the two and thus the progress of the account.

The Fund-Tax program is available only in the 32K version. It provides a

hardcopy summary of dividends, interest, and capital gains for any period you select. This program is very helpful in preparing tax returns and tax planning. Since there are no embedded print codes, most 80-column printers will have no problems with it.

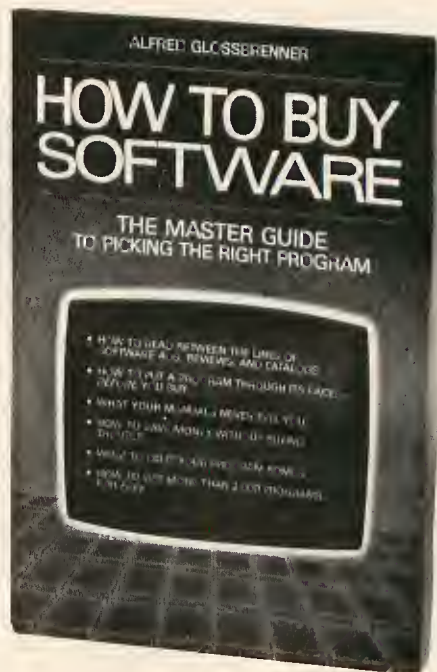
In summary, Fundfile may be overkill for the casual investor, but the serious stock-market fiend will love it.

Mr. Parsons is very responsive to written questions about problems you have, and keeps registered purchasers informed of bugs and fixes. If you are heavily into mutual fund investing, Fundfile is a good buy.

— Sam Clarke

How To Buy Software

by Alfred Glossbrenner
St. Martin's Press
175 Fifth Avenue
New York, NY 10010
648 pages
\$14.95 paperback



Choosing software is always difficult. You have to list all packages that do what you want, compare them, and select one that offers the most of what you want in the price range you can afford. If you don't know what you're doing, or where to look, or if you don't know what features are necessary or desirable, the job becomes overwhelming.

Mr. Glossbrenner has written a book that makes it easier to locate and select

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the software you need for your computer, and he does it quite well. *How To Buy Software* is a massive tome that teaches you how to read between the lines of advertisements, reviews, and catalogs to determine what is *really* meant, and what is being concealed. It also includes hundreds of tips on using your software efficiently, and explicit instructions on what to look for in all types of software.

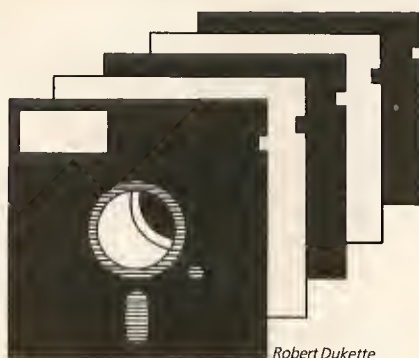
The book's first 170 pages describe the foundation of information every software purchaser should have, including hardware and software concepts not mentioned in most manuals, like what makes one CPU chip different from another and how that affects computer design and available software. Operating systems' basic input/output, and other modules are covered, too. There's a section on how to ask questions regarding compatibility, and what operating systems like CP/M, MS-DOS, and so forth really mean to the average user.

There are 100 pages that teach how to survey the software field and put programs through their paces. This section is extremely thorough. After five years in the micro field, I consider myself an expert at locating and evaluating software; it's how I make my living. Mr. Glossbrenner surprised me with quality, in-depth coverage of how to find free software.

The end of the book is devoted to specific software topics. Nothing is left out — CompuServe and The Source are cited wherever appropriate, as are hundreds of other companies and resources. The book includes a descriptive table of contents, a 13-page glossary of terms and a complete index. Appendices cover sources of catalogs, magazines and newsletters, on-line databases offering software reviews, and a copy of one issue of *The On-Line Computer Telephone Directory*, published quarterly by James Cambron, which lists about 600 phone numbers per issue.

If you buy this book you won't regret it, whether you're a beginner or a veteran in the microcomputer field. If you really want to buy *only* the software you need, if you want to save money, this book is a treasure.

— Terry Kepner



Robert Dukette

WORD PROCESSING

Elite-Word

Elite Software
Box 11224
Pittsburgh, PA 15238
(412)795-8492

32K, 64K

\$59.95 cassette or disk

"Considered to be superior" is how my dictionary defines "elite." In most respects, Elite-Word is a superior word processor. It's easy to use, too. A couple of things, however, prevent it from always living up to its name.

This assembly language program lets you see text as it will appear in print, edit Basic programs, and create personalized form letters by merging them with a name/address file. It uses one-key commands to save or load programs, print, go to Basic (only in 32K), toggle word-wrap on or off, jump to the beginning or end of text, and find a string. One-key commands also perform block moves, deletes, and copies. You can also start new text, display and change the drive default number, display the directory with free grants, hide or reveal carriage returns, toggle the display to green or white, and enter one of two text writing and editing modes.

The type-ahead keyboard buffer is a mixed blessing. It lets you rapidly type words into the middle of text without a missed character, but when your file length reaches the neighborhood of 7000 characters, does so with a noticeable screen-writing delay. The delay is a liability when you want to make corrections at the top of a long text.

The slow response to keystrokes can be frustrating.

Push the I (for Insert) in the Main Command Mode to enter or edit text. Pushing the x from that mode puts you in Xchange mode, which overwrites whatever exists at that location. You return to the Main Command Mode from either editing mode by pushing the Break key.

In each writing mode the help line displays the mode, the number of available characters, the number of characters already typed, and whether the keyboard is in upper- or lowercase. All screen editing features are available in the Main Command Mode or either of the two editing modes.

Arrow keys control cursor movement. The Clear key (used as a control key) is combined with others to delete the character above the cursor, delete the line the cursor is on, and page forward or backward through text. It also rewrites the screen following deletions and additions, backspaces and deletes one character and opens up one space at the cursor location.

The 19-line by 32-character screen is but a minor improvement over the standard Color Computer display, but Elite says that size was chosen for optimum readability. Characters are easy to read and have true descenders. With word-wrap on, however, lines with long words can be limited to as few as three words per line.

A smooth forward-scrolling technique that moves one video line (versus one character line) at a time floats lines slowly upward so it's nice and easy to scan text.

The 32K version provides a 13.5K file size, while the 64K provides 22.4K, or roughly 14 pages of double-spaced text at 60 characters per line.

Output and print format control codes may be embedded in text. These codes center lines automatically, place markers to merge specified lines from a variable text file into the main file, execute a form feed, and execute embedded printer commands.

In the Main Command Mode, pushing s (for Save) prompts you for the file name. If you've previously loaded a file its name appears and a simple

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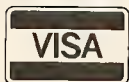
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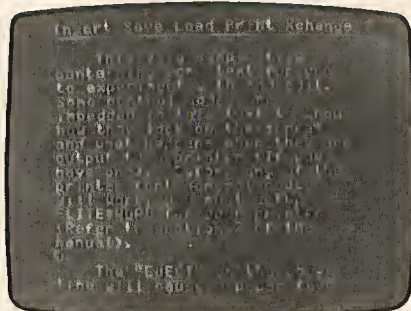


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Elite Word Screen

carriage return rewrites to it. This is a big time-saver in updating text files.

Three file formats are available. Default binary executes a rapid save and includes all printer format output specifications. Formatted ASCII saves the file line for line as it would be sent to the printer. Source ASCII saves the file in standard ASCII format but first eliminates all formatting. This format lets you use Elite-Word's powerful editing commands to edit Basic programs. The Load command works much the same way. In the disk version, the file is appended to what exists in the buffer.

The Quit command is intended to exit Elite-Word and perform a cold start. When I run the 32K disk version, it works like a charm, but running the 64K version always puts garbage on the screen and makes me hit the Reset button to bring up the sign-on message.

The Change command performs an automatic global find and replacement, searching from the cursor location forward. It is powerful, but like any other global find and replacement, must be used carefully: carelessness in typing can easily cause unexpected changes in words within words.

The Find command, when used with the Again command, locates specified strings. This command can be a time-saver in editing Basic programs by finding all occurrences of any specified variable.

The Block command is another powerful editing feature. Delete requires only one marker to be set and the cursor to be at the end of the block.

The Block Move command erases the block and rewrites it in a designated spot. The Block Copy command does what its name implies. A ?MEM error message appears and text is left intact if the buffer cannot accommodate it.

With the printer formatting menu you set the left margin, characters per line, line spacing, page length, number of copies, top and bottom margins, and page numbering. You have options to justify text, pause after printing each page, name the file to be merged into the variable text markers, and select fonts. From this menu you call a unique viewing command, View Text, which lets you see any text in a high density display as it will appear in print. With text wider than 64 characters you can view from either the left or right margins. Page breaks are designated by dotted lines and page numbers appear at the bottom of each page. Text justification is also shown, as are dynamic margin changes and the top and bottom margins. The View mode removes or implements imbedded format codes depending on instructions.

Superscripting, subscripting, and underlining are not among the central features of Elite-Word, but can be executed, albeit with numerous keystrokes.

Elite-Word's output format was written with the Epson MX-80 in mind but is adaptable to other printers, the manual says. With one exception (centering extended-width print), I interfaced it properly with my Okidata Microline 92.

Type fonts can be chosen before running the program or as imbedded hex codes within text. Each code must be fully defined, preceded and followed by control characters each time you turn a font or special function off or on.

Elite-Word provides line autocentering which the documentation claims will adjust for double width print. It would not center my Okidata's double-width print but worked well with regular sized fonts.

Only five pages in the 59-page manual hold your hand; after that you're on your own. Commands are described succinctly in the order in which they appear on the screen — not necessarily the order in which you'll try them out. Directions for backing up this copyrighted but unprotected program are in the back of the manual.

Printer font codes may be entered before you run Elite-Word. Directions for doing so, however, refer only to the "EW" program (the 32K version). It took me a while to figure out that I had to enter the codes in EW64 for the 64K version I was running. The documentation was no help there.

The copy supplied for review had no tab or tab-set function, but that, plus headers and footers, have since been added.

Elite-Word has many good points and is moderately priced. If you don't mind seeing a relatively small portion of text at one time, and don't need a lot of scripting and underlining, it makes word processing a breeze.

— Martha Sheldon

Master Writer

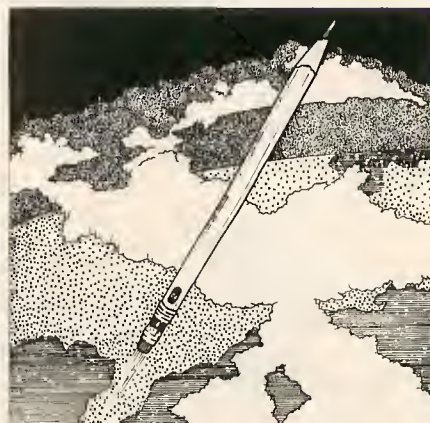
Pyramid Distributors
527 Hill Street
Santa Monica, CA 90405
\$14.95 tape, \$19.95 disk

Imagine a word-processing program that does not require an extensive user's guide.

You're probably thinking of Master Writer — it practically runs itself from the menus and help screens.

The ten functions of the main menu are these:

1. Load
2. Save
3. Display text
4. Print to printer
5. Print to buffer
6. Print from buffer



Rod McCormick

OS-9[®]

SOFTWARE

from The JBM Group, Inc.

GENUS

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Circle No. 37 on Reader Service Card

7. How much memory left
8. Options
9. Exit to Basic
10. Clear memory

You can select Option 3 and immediately begin typing text because Master Writer includes preset screen formatting.

If you have any difficulty remembering the control key commands, press Clear and the H key to display the Help menu.

Color Computer users are always searching for programs that are simple to use. This program can provide a simple and efficient means to write with our machines.

In addition, I believe Master Writer is valuable to educators. Any teacher interested in introducing the concept of word processing to students in grades 6 - 9 would find this program very adequate. The ease of saving, loading, or editing text will make writing assignments more pleasurable for students.

— David Macali

DATA BASE MANAGERS

Filebox/16 Home Filing System

Circling Star Software Co.

P.O. Box 1218

Freehold, NJ 07728

16K Extended Disk Basic

\$29.90 disk

Filebox/16 Home Filing System is a collection of 10 Basic programs driven from a main menu.

Filebox/16 allows you to create and maintain files of records of up to 256 bytes long with a maximum of 10 fields. Some of its suggested uses are for automobile maintenance records, lists of addresses, book and record collections, and household inventories.

Filebox/16 comes with full documentation describing set-up, general features, possible problems, and main menu commands. Also included is a sample of field structuring in the form

of an address file. There is even a section on future modifications for 32K upgrades.

You can print all your files with your printer or to the screen in one command with or without field headings for your mailing list needs.

Operation is simple and self-explanatory. Filebox/16 has these commands: information, get help, look, change, add, delete, sort, directory, free, and quit. Your first choice must be to create some files. Once you have files you can try out the sort and search commands, or investigate the utilities section, which enables you to make some changes in the characteristics of your file.

As far as negatives, this software has its share. You can't change the length of a field. I also found a kink in the free space warning system. If you have less than 10 grans remaining on the disk you're supposed to be warned that you cannot enter any more data. My copy did not warn me upon reaching 11 or 12 grans — I couldn't add to an existing file or create a new one.

— Robbie Anderson

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VIP Database

Softlaw

9072 Lyndale Ave., S.
Minneapolis, MN 55420
\$59.95, 32K disk

VIP Database is compatible with other members of the VIP Library. It works best with 64K and multiple drives if your database is very large. Because some enhancements are available only to 64K users, the program disk comes with two distinct versions: one for 64K and the other for 32K users. Both programs are completely menu-driven, quickly learned, and easy to use.

First-time users must first create their database. The editing commands are fairly straightforward and the editor is a full-screen version. You must follow some fairly rigid rules, however, when creating your data entry fields. I have found that the best way to set up screens is to design them in advance. You can use VIP Writer as your editor (if you have that software), as it is more powerful than the VIP Database editor.

(You simply create a file using VIP Writer and save it with the appropriate file name. This is how I set up my screens, and it worked well.)

A major drawback I found to the database editor was its inability to insert entire lines.

Your database is set up in a (direct access) file on the disk.

The Create Database command will delete any data files already existing. If, for example, you decide to change your form slightly after entering a number of records in your database, you will have to perform the create function again and re-enter all your records. Make sure your forms are set up to your satisfaction before beginning maintenance on your database.

A Verify Disk command checks your disk for bad sectors and warns you if you have a bad disk.

A Rename command lets you re-name files without exiting the program. The Kill option (also possible without leaving the program) has a built-in safeguard that asks Are You Sure? before issuing the Kill command.

There is a screen default menu, a submenu which lets you select your

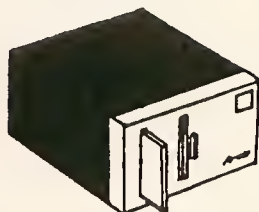
display. You have the following choices:

- L Light background
- D Dark background
- G Green screen
- W White screen
- 5 Screen width 51
- 6 Screen width 64 wide
- 7 Screen width 64 narrow
- 8 Screen width 85
- Q Quit

Below the database maintenance menu, the program shows you the number of the first record in the file and the next file number to be added. I found the continual reference to a record as a "file" extremely confusing. A file is usually considered a collection of records and a "record" is a collection of fields. Both on-line and in the documentation, records are referred to as files. This is confusing and misleading — Softlaw should change it.

An Edit, Search or Display file selection lets you change existing records or search for and display a specific record. Searches are performed using your

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Treasure Hunt

A graphics text adventure. You walk with our graphics character through desert, mountains and city to seek the illusive treasure of gold. Super graphics with a person who walks with you at each turn. Tape - \$24.95, Disk - \$29.95.

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Keep track of all those accounts with current list of accounts, statement printing, last activity date, and current month's transactions, debits & credits. Disk storage of data 32K disk, \$29.95.

Loveless Manor

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standard data entry screen. You enter the data you want matched, the Boolean operators, the type of match you want and VIP finds and displays the first record meeting the criteria. A Next option will find the next record, and so on, until there are no more matches. Multiple keys (using logical AND and OR) can be used also.

You may edit any field, and a record can be restored to its original condition. Moving from field to field during an edit is easily accomplished via the Up- and Down-Arrow keys.

The Update option does not let you change the form itself, but lets you change the default fill character. In VIP Database, every field is filled with some default character; that is how the field length definition is set up. This option lets you choose a specific default character. For example, say you were going to add several sales records which all had the same transaction date. You could update the form to include that default date and you would not need to key in the date on each record.

The Print Menu option lets you set up your printer defaults, list item attributes to the printer (item attributes are lists of the attributes of each field in the record), edit your print form or kill a print form.

A print form is similar to the data entry screen — it is used to format printed information. When you print, you may select a range of records to be printed. You may have as many different forms as you like, each with a unique form name. A major drawback is the inability of the program to create lists of records. It is set up to produce a filled-in form for each selected record. You can't generate a columnar list with specified information from each record forming the columns and each record representing the line. That limits the power of the print facility.

You may sort your database (in ascending or descending order), using any field as a key. There is no provision made for subsorts using multiple sort keys. An unsort feature restores your database to its original order. This particular feature can be very handy when you just wish to temporarily sort (for a report, for example). (I sorted a file of about 30 records, with fairly quick results.)

The Copy A File command really means duplicate a record (again, the reference to a record as a file is an-

noying and confusing). You can duplicate a record, then edit it as required. I found this useful when creating a database with many similar records; it saves much keying time and can considerably speed up the data entry process.

**"All things
considered,
I consider VIP Database
a good product."**

Math Form Edit refers to the ability (64K version only) to add, subtract, multiply, divide and evaluate formulae. The math package lets you use a dollar mode (used for dollar values) and a 16-bit floating point mode (used for other precise calculations). Using the database editor, you can key in your formulae on a blank work screen to represent variable values. You may create new items by using computations and then use those items on reports you might print. This feature is one of the better parts of the package and can be useful for just about any type of calculation you might want to do.

VIP Database has size limits that restrict the length of a record, the size of a file, and other manipulations you may wish to perform. The maximum number of characters in a single item (field) is limited to the line length - 3. For example, if you have the line length set to the 85 character display, you can have a maximum field size of 82. The total number of fields in a form cannot exceed 127 (for 32K) or 255

(for 64K). The total number of characters in all fields cannot exceed 255 (for 32K) or 767 (for 64K). To let you keep track as you create your forms, a single command tallies the spaces you have used so far and displays the number for you.

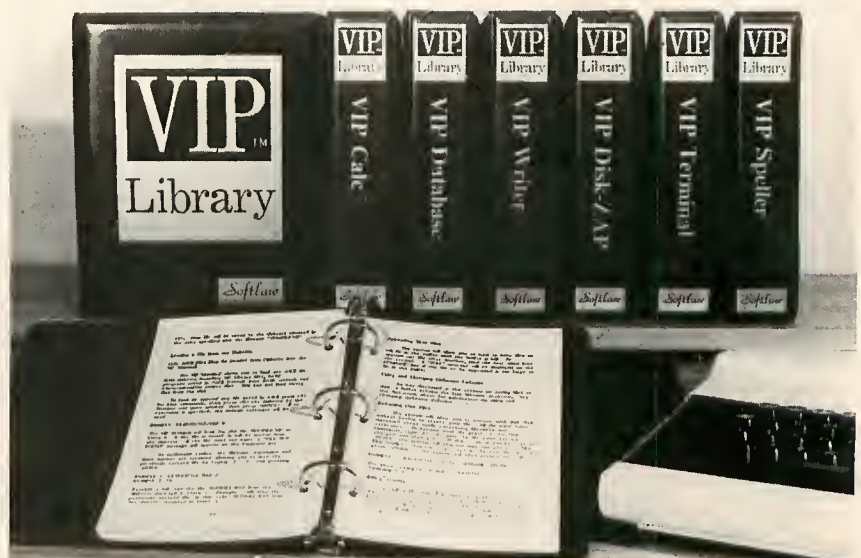
The number of records that can be stored on a single disk depends upon the total number of characters in the record. An individual record will take the following number of blocks:

255 bytes	1 block
256-511 bytes	2 blocks
512-767 bytes	3 blocks

Since there are 567 blocks on the first database disk your database will be limited to 567 one-block records, 279 two-block records or 186 three-block records. If you have 64K, you may add up to three additional drives with 612 blocks each, giving you up to a possible 2,394 records!

What does all this mean? It means that the maximum number of records you could have in a database (with four drives, 64K and one-block records) would be 2,394. The minimum number would be 186 (with 32K, a single drive and using three-block records). Everything considered, this gives you a fairly good size to work with, especially if you have additional drives.

VIP Database has some special features. Using it with other VIP Library programs (most notably VIP Writer), you can add features such as Mail-merge, which enables you to develop a form letter using VIP Writer and merge a name/address database into it, printing copies of the letter to each person on the mailing list automati-



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cally. The option is easy to use, although hard to set up. Even without VIP Writer, Mailmerge can be used with good results to print mailing labels. (Mailmerge requires 64K to operate.)

The documentation for VIP Database is outstanding. It comes in an attractive binder (small 9 by 7 size) and contains 106 pages of instructions. I found the instructions complete, clear and organized. Virtually all my questions were answered somewhere in the manual. Other than the terminology (file versus record) complaint already mentioned, I consider the documentation top-notch.

In general, VIP Database has several advantages over other database managers: first, the amount of memory required to run it is flexible. It will work well on either a 32K or 64K system and will work just fine with a single drive. Second, it supports additional drives, letting you expand your database considerably. Third, it is well-documented. Fourth, it is completely compatible with the other members of the VIP Library, giving you some options not available with other database programs. Fifth, it is easy to learn and use, is completely menu-driven and is very user-friendly. Sixth, its high-resolution screen is great and it has a number of display options.

Like all software, VIP Database also has its disadvantages. I found the report-writing portion restrictive, especially with regard to its ability to produce formatted lists using multiple records. I had occasional problems losing database forms on disks. I am not sure why *this happened*, but it did several times; I had to recreate my database from scratch and re-enter all my data. I tried calling Softlaw, but was unable to get any response to my questions. Eventually, I was able to get everything set up with no hitches, but you had better believe that I make heavy use of the Back-up command now.

I also found the restrictions on form layout hard to get along with, particularly the restriction that forces you to have only one space separating fields on the same line. I feel that this does not allow enough freedom in data entry form format.

All things considered, I consider VIP Database a good product. It performs as advertised and, except for the unknown problem mentioned above, seems to work well. It is easy to learn and yet powerful (a rare combination these days).

—Norman Garrett

BUSINESS

Handbook of Computer Applications for the Small or Medium-Sized Business

by Howard Falk
Chilton Company
Chilton's Computing Series
Radnor, PA 19089
1983
\$19.95

Has your child's "toy" piqued your interest in computers? Have you started to think about using one at work but are not quite sure of the applications? If you answered yes, then I have a book for you. *The Handbook of Computer Applications for the Small or Medium-Sized Business* by Howard Falk is designed to acquaint the novice with the full range of considerations for a computer system installation. The orientation of the book is toward the larger "mini" based systems, rather than "micros" such as the IBM-PC, Apple II, and, of course, the Color Computer.

The Handbook is intended to bring to your attention the many things that you should consider when installing a system. It contains a series of case histories that will stimulate ideas for applications, and warn against pitfalls.

The Handbook is organized into five areas: general business applications; case histories; software; computer systems (hardware); and acquisition, installation and start-up. The book also includes a glossary.

The first section covers all business applications, beginning with basic general ledger systems, continuing through accounting subsystems such

as receivables and inventories, and ending with spread sheet, word processing and data storage applications. Included in this chapter is also a description of communication capabilities.

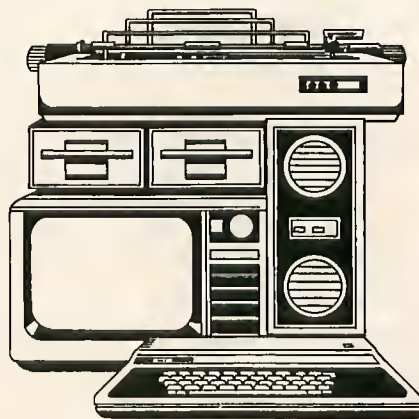
The author describes not only the function, but also points out some of the key "control" and "business" aspects. As you can see, the book presents much diverse information under one subject heading. The information is welcome, but this approach can be confusing.

The chapter on business applications is followed by case histories. The cases vary from examples of botched installations through examples of how businesses benefited from automation. The stories are short and easy to understand, and are designed to stimulate ideas. The stories do add a real-life perspective, but I thought they would be more effective at the beginning or end of the book. The stories also appeared to be taken from another publication; their tone was markedly different from that of the rest of the book.

Once again, the software section tries to cover all facets of the subject. Starting with an elementary explanation of software and its purpose, the chapter continues through a discussion of computer languages. The discussion of packaged versus custom software is quite extensive and is must reading for a prospective system buyer. Interspersed through the commentary are questions and key objectives to keep in mind. The chapter closes with hints on contracting for custom software and cautions about the extensive amount of substandard software on the market, a warning well-taken.

The computer system discussion takes you through the nuts and bolts of the hardware. Included are descriptions of such things as CPUs, line printers, and storage devices. The chapter also discusses software such as database managers and the databases themselves. The chapter contains hints on controls, applications and warnings. Once again, the combination of subjects and levels of discussion tend to distract and confuse.

The Handbook ends with a guide to acquiring and installing a system. The author takes the reader through the beginning steps, such as deciding applications, through selecting the system and the vendor. Covered in the text are such items as requests for bids, required maintenance and education.



Robert Dukette

SUPER SCREEN



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You can now write truly professional looking programs that combine text with hi-res graphics. Super Screen allows you to create graphics displays with the Basic LINE, DRAW and CIRCLE statements and then notate the graphics with descriptive text. You can even use PRINT @ if you wish for greater programming convenience. Super Screen's versatility will amaze you.

PRINT @ IS FULLY IMPLEMENTED

The PRINT @ statement is a valuable asset to the programmer when formatting text on the screen. The standard Color Computer will report an error if you specify a location higher than 511 but Super Screen allows locations all the way to 1223! You get a big screen and a powerful formatting tool as well. Of course, Super Screen also supports the CLS command allowing you to clear the big screen using standard Basic syntax.

ON ERROR GOTO

That's right! Super Screen gives you a full implementation of ON ERROR GOTO including the ERR and ERL functions. Now you can trap errors and take corrective action to prevent crashed programs and lost data using the same standard syntax as other computers. The ON ERROR GOTO capability overcomes a serious deficiency of Color Computer Basic and greatly improves your capability to handle sophisticated tasks. All well written, 'user friendly' programs use error trapping techniques and yours can too! Now that's power!

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No more frustration as you edit a long line in your Basic program; just hold the space bar down and automatically step to the desired position in the line. Need a line of asterisks? Hold the key down and auto repeat will give them to you. Those of you who spend many hours at your keyboard will appreciate this outstanding addition to Super Screen's long list of impressive capabilities.

CONTROL CODES FOR ADDITIONAL FUNCTIONS

Super Screen recognizes several special control code characters that allow selection of block or underline, solid or blinking cursor and other functions. You can 'Home Up' the cursor or you may erase from the cursor to the end of a line or to the end of the screen just like many other computers. These special codes give you an extra dimension of versatility and convenience that put Super Screen in a class by itself.

AND MORE GOOD NEWS...

Super Screen comes with complete, well detailed instructions and is available on cassette or disc. It adjusts automatically to any 16K or greater, Extended or Disc Basic Color Computer or TDP-100 and uses only 2K of memory in addition to the screen memory reserved during power up. Guaranteed to be the most frequently used program in your software library...once you use it, you won't be without it! Super Screen's low price will really please you; only \$29.95 on cassette or \$32.95 on disc!

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The Mark Data Products sales order processing system will give a fast, efficient means to enter orders, print shipping papers and invoices, prepare sales reports, and monitor receivables. The system automatically enhances the monitor screen to a 51 character by 24 line display. 32K of memory is required along with an 80-column printer, and one or more disc drives.

The MDP order entry system is a family of programs which operate interactively by means of a "menu" selection scheme. Up to 900 products may be defined and a single disc system can hold over 600 transactions. When the operator selects a task to be performed, the computer loads a program designed to handle that task from the system disc. The system disc contains all of the programs required to create, update and maintain data files and prepare the necessary paperwork including shipping and invoice forms, daily sales reports, a monthly (or other period) sales report and a receivables report.

The MDP system:

- Is accurate, user friendly and simple to use.
- Is easy to customize for specific user requirements.
- Produces a traceable invoice.
- Handles receivables as well as closed orders.
- Is capable of future expandability.

This accounting software equals or exceeds higher priced packages for other computers and includes a detailed operating manual. For just \$99.95.

ACCOUNTING SYSTEM

The Mark Data Products accounting system is ideal for the small businessman needing a fast, efficient means to process income and expenses, prepare detailed reports and maintain most of the information required at tax time. The system is a family of programs which operate by means of a "menu" selection scheme. When the operator selects a task to perform, the computer loads a program designed to handle that task from the system disc. The system disc contains all of the programs required to create, update and maintain data files and prepare the necessary accounting reports including a transaction journal, a P&L or income report, an interim or trial balance and a balance sheet.

Up to 255 separate accounts may be defined and a single disc system can hold over 1,400 transactions. This system automatically enhances the monitor screen to a 51 character by 24 line display. 32K of memory is required along with an 80-column printer and one or more disc drives.

The MDP system:

- Is accurate, user friendly and simple to use.
- Is easy to customize for specific user requirements.
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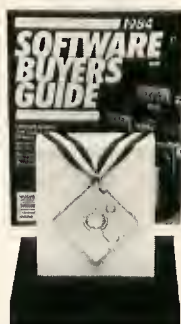
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All in all, the Handbook is a valuable tool when contemplating installation of a system. The amount of information provided is enormous, and the author continually provides subjective commentary on what should be done and not done. Especially helpful are summary checklists of important points; these help the reader sort out key elements from the mass of information provided.

On the other side, the Handbook tries to be all things to all people. It is distracting to jump from level to level within the text; the author often addresses both elementary and advanced topics in the same paragraph. At times the book appears to be more a collection of random thoughts than a well-organized reference book.

— Thomas Foster

Business Manager

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Did you buy your computer to keep your company books or to track your personal finances? If so, Business Manager could be for you. It's a single-entry small business accounting system written in Basic that's easily transferable to disk.

Once you have the program loaded and running, you'll see 12 choices on the main menu. They are: Input Transactions, Replace Transactions, Delete Transactions, List Account Transactions, List All Transactions, List Account Totals, Print All Transactions, Monthly Statement, Yearly Statement, Tape/Disk Routines, Condense Transactions, and Name Accounts. To get the system started you use Name Accounts. What you do is set up the accounts, alphabetize them, and print them out for later use.

The Input, Replace, and Delete Transactions options give you quite a bit of control over what goes on in the system. Together they form a fairly strong transaction editor.

The options that let you List Account Transactions, List All Transactions, List Account Totals, and Print All Transactions give you an overview of what's happening in the system. The List Ac-

count Totals option is particularly handy because it lets you see exactly where your company or personal finance is going.

The Monthly Statement option has two sub-options, one of which clears all of the entries for that month, clears the monthly totals, and adds the monthly totals to the yearly totals. In other words, if you want, it will clear and set up the next month. (That's slick.)

The Yearly Statement option also has two sub-options. You normally use it to get a yearly statement. But you can use it to clear all the totals and set up a new year's accounts. This is like restarting the program, but the account names are not lost. This kind of implementation makes this program stand above average for its type.

The Tape/Disk Routines are pretty much what you would expect. You can load or save from either tape or disk. There are three files set up by the program and they are automatically taken care of by the routines. In other words one load or one save is all that is necessary.

The Condense Transactions option is another unusual one. All transactions are in memory for fast retrieval. Memory can only hold 300 transactions. When you get near 300 you delete them with Condense Transactions. The transactions are removed but not the totals. The totals are kept in whatever account they belong. The whole system is renewed and the totals of the transactions are not lost — another clever implementation.

Is this program a good buy? Well, the price is right, and the documentation is good! Putting that aside, a lot depends on how complete an accounting program you are looking for. While it is called an accounting system, Business Manager is really more like a profit and loss statement. There are no capital, asset, and liability accounts which generally make up a full-blown accounting system. But what it does, it does well.

The main reasons that double-entry bookkeeping is so popular are that it's easier to find mistakes, and if someone else keeps the books, it's pretty hard to steal. What this means is, if you're the one who keeps the books, and you're careful, you should have no problems with single entry. For the price, Business Manager does a terrific job.

— Bob Jack

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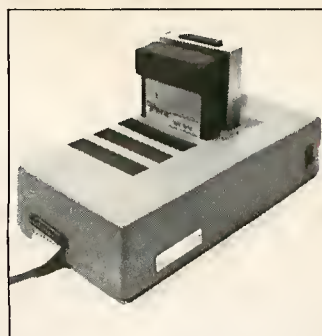
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Color Computer/57

GAMES & ENTERTAINMENT



Hey, let's play a game together, or do something else with our Color Computer that's really entertaining. These programs can take us on a journey through the stars, into inter-galactic fights, through never-before-imagined lands . . . They can thrill us, chill us, tickle our fancy, stir our imaginations, push our thinking processes to the limit, and — sometimes — teach us a handy trick or two.

Rainbow Quest

by Richard Ramella
Wayne Green Books
Peterborough, NH 03458
(603)924-9471
16K Extended Basic
\$24.97 cassette and paperback

You have read and enjoyed Richard Ramella's Sorcerer's Puzzles here in **The Color Computer Magazine**. Now he's written a classic children's story called *Rainbow Quest*.

Rainbow Quest is more than just a story. Sprinkled throughout the book are 25 Color Computer games. The *Rainbow Quest* package comes with the 25 games recorded on cassette. You must play and win each game to learn the key word you need to play the next game. Key words are listed at the end of the book to help children progress past games they're unable to win.

The Story

The tale begins as Molly and Sam are sent by their parents to another planet to take part with dozens of other children in the *Rainbow Quest*. Their task is to travel 400 miles west in one week, with just a few supplies. They must use their heads to find food and transportation.

As the *Rainbow Quest* leader says in his opening speech, "You won't be adults when you complete the *Rainbow Quest*, but it's an important step toward growing up. It gives you training for going on your own, for using your noodles, for making decisions... you're in for a lot of surprises in the next seven days."

"A lot of surprises" is putting it mildly. On their quest the children encounter nasty pirate kidnappers, good and bad robots, and a fairy child. They pilot magical vehicles (every child's dream), and learn to fly.

I won't give away the story's ending, but it surprised and pleased me.

The Games

The games accompanying *Rainbow Quest* are written in Basic. They include logic puzzles, sight and sound recognition, and arcade-like action, among others.

I enjoyed the logic and sight recognition games the most. They reminded me of board and card games I played and loved as a child. Remember the white plastic cross-shaped game board with red pegs in all but the center hole? You had to jump over and remove all the pegs until only one was left. I didn't grow out of that game, but stopped playing it after losing most of the little red pegs in my set. That game appears in *Rainbow Quest* under the name "Redboot Parade." I couldn't tear myself away; I played it for hours.

The arcade games, however, are more frustrating than fun. In general you must use the Arrow keys to pilot an object through a set of obstacles. In some cases you must repeatedly hit the keys to move; in others you can just hold the keys down. Unfortunately, key response is horrible in these games — there is always a painfully noticeable gap between hitting a key and seeing the object move. At times these games seemed impossible to win. I couldn't get the Arrow keys to work at all in the second part of "Magnetorites" and, I'm afraid, sent all of my space-ships to fiery crashes.

The replay capacities of the games are inconsistent. The first, "Timegate," won't let you quit until you've completed the course. That last time gate

is pretty narrow — I don't want to talk about how long it took me to get through it. I certainly would have appreciated the option to quit every five games or so.

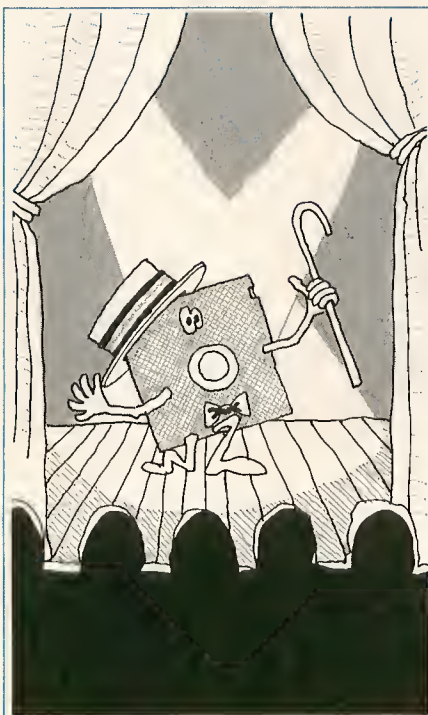
Other games suffer the opposite problem. They don't give you a chance to play again without restarting the program. Every time I crashed into a "Corkscrew Highway" wall or made a logic error in "Checker Plain," I had to hit the Break key, type RUN, and reenter the key word to play again.

File names are not always the same as stated in the text. For example, the instructions on page 5 tell you to load *Timegate*. Typing CLOAD"TIMEGATE" won't get you anywhere, though. You must use CLOAD"TIME". The blue leaflet accompanying the package explains this and lists the file names, but I forgot to check it more than once. This information should have been included in the text rather than in supplementary instructions.

The book and cassette are packaged in an attractive plastic case that will fit neatly on your bookshelves. The book is well-designed: the artwork blends nicely with the story, and the spiral wire binding lets the book lie flat when you're playing a game.

All in all, I enjoyed the book thoroughly and the games occasionally. Combining a fiction story with computer games is a good idea, but the games in this package need a little work.

— Lynn Rognsvoog, staff



Food War

Arcade Animation, Inc.
21 The Fairway
Upper Montclair, NJ 07043
\$24.95 tape, \$27.95 disk
16K

Food War is an arcade game in which you try to move past numbers of chefs and over to your ice-cream cone before it melts.

You can attack the chefs by throwing food at them. They can also throw food at you.

There are several levels of play. The graphics in this game are good.

Food War is a good add-on to your collection of arcade games.

— Chris DeSimone

Time Fighter

Mark Data Products
24001 Alicia Parkway #207
Mission Viejo, CA 92691
(714)768-1551

16K Color Basic, Joysticks
\$24.95 cassette, \$27.95 disk

This game is my idea of getting the most out of the Color Computer, and with only 16K to boot!

In Time Fighter you are the pilot of a space fighter, with a mission to seek out and destroy the Time Guardian. But (as always, it seems) it isn't quite that simple. You must first pass through three time zones and their obstacles with only a limited amount of ammunition.

Among your hurdles are fireball-spitting birds, WWI machine-gun fire, guided bombs, smart missiles, and mine fields. Sound rough? Don't expect to master this one quickly.

The game is fast and the graphics are well done. One nice touch is the Pause feature. Joystick control is a bit sluggish at times, though.

In conclusion, Time Fighter is a winner. It is not a game to be easily mastered and then put away on the top shelf in the closet. To Robert Shaw, author of the program, my compliments.

— David Barry, Jr.

Cu*Ber

Tom Mix Software
4285 Bradford N.E.
Grand Rapids, MI 49506
(616)957-0444

\$27.95 cassette
\$30.95 disk
32K

Cu*Ber is the Color Computer version of the popular arcade game O'Bert. It is your job to hop from cube to cube, changing their colors to the target color displayed in the upper left corner of the screen.

This may seem simple, just hopping on a cube and changing its color. On different levels the cubes change color in different ways. On level two it takes two jumps to change each cube to the target color. In levels three and four one jump will change a cube to its target color, but jumping on that same cube again will change it back to its original color.

Cu*Ber must avoid vipers and nerds. Dorks can jump on cubes and change them back to the original color. There are also bouncing balls — some help you and others are deadly. Sound intriguing?

With Radio Shack joysticks Cu*Ber is not self-centering. Having the stick in the wrong position when Cu*Ber comes on the screen will move him in that direction. Stopping Cu*Ber on any given cube is no easy trick. A self-centering joystick makes playing the game more dependent on skill rather than luck.

All in all I found Cu*Ber enjoyable. It can entertain an adult, yet it's simple enough for my 5-year-old to play.

— Kenn Perry

Galagon

Spectral Associates
3418 S. 90th St.
Tacoma, WA 98409
(206)581-6938

\$24.95 cassette
\$28.95 disk
32K

Galagon is a version of the arcade game Galaga. It looks good, sounds good, and plays right.

You are in a spacecraft that moves horizontally across the bottom of the screen. In the first screen five strings of aliens attack your spaceship by looping above you, and departing to the top of the screen. As your enemies attack, they drop, disappear through the bottom of the screen, and reappear in the top formation, if you haven't shot them.

When the last enemy is blasted out of existence, a new screen starts with strings of aliens attacking and going into formation at the top of the screen.

There are three types of aliens in Galagon. The blue aliens are worth the least, the red aliens are worth more points, and the Boss Galagons are the most difficult to deal with. Boss Galagons must be shot twice to be destroyed, and they can stop a dive and extend a vertical tractor beam that will capture your ship.

When your ship is captured, the Boss Galagon drags it wherever he goes. You must try to shoot the Boss Galagon; if you're successful, you double your fire power.

Other features of Galagon are: more than 50 possible screens; you earn bonus ships after scoring 20,000, 50,000, and each additional 50,000 points; and every third screen is a challenge screen that offers you a chance to earn bonus points.

This is a great game. If you like the arcade version, buy this one.

— John Jermaine

Tut's Tomb

Mark Data Products
24001 Alicia Parkway, No. 207
Mission Viejo, CA 92691
(714)768-1551

\$24.95 cassette
\$27.95 disk

Archaeology and the supernatural that surrounds it has always intrigued me. The object of Tut's Tomb is to guide your man (an intrepid adventurer on an archaeology treasure hunt) through the treasure-laden tomb of the great Pharaoh. The caves are filled with more than just treasures; also to be encountered are bats, vultures, a whirling curse, and snakes. I hate snakes!

Before starting the game (but after loading) the program gives you a preview of what is to come. All 16 levels (chambers) are shown. The game's increasing complexity becomes apparent as the display advances toward the 16th level. You can escape the display mode and get on with the game at any time by pressing any key.

Each chamber is a yellow brick-lined maze. The previously mentioned nasties do their best to keep you from gathering passage-way keys and treasures. You win points for each treasure collected, each key obtained, and for each nasty you shoot. Your adventurer's gun will fire only to the left or right (horizontally) and in only one direction at a time. The gun works well until the creatures begin to swarm, or one has you trapped in a vertical movement, or even worse, you run out of time (not time to play, but time to use your gun). You begin with a timer value of 100. The value decreases as you play. Whenever you open the door to a large treasure your timer is reset to 80. Even when you're out of time the situation is far from hopeless — you can fire a flashbomb. All the

creatures vanish giving you the opportunity to make haste. You earn a flashbomb every time you open a large treasure door or after losing a man to the creatures.

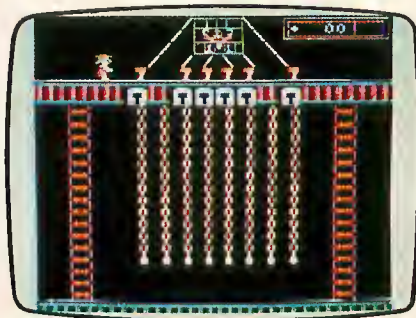
Flashbombs are indeed your secret weapon. So secret, in fact, that how to operate them was left out of the documentation. I was killed numerous times before my son discovered that the spacebar controls the flashbombs. The documentation also fell a bit short on its loading instructions. Once the program has been loaded, and the screen changes from a Mark Data logo to a red test screen, you're supposed to hit any key to get into the game. Hitting just any key doesn't do it; you have to hit the Enter key.

Aside from these documentation glitches, the game is very good. I became hooked. As soon as one game ended I began another round. Tut's Tomb has really good graphics and sound effects. I recommend Tut's Tomb to all arcade game fans.

— Jean Plesser

Junior's Revenge

Computerware
Box 668
Encinitas, CA 92024
(619)436-3512
\$28.95 cassette
\$31.95 disk



Junior's Revenge is Computerware's sequel to the popular Donkey Kong arcade game. In Donkey Kong you were Luigi, trying to save your girlfriend from the giant ape. After you saved the girl, you captured the ape and put him in a cage.

In Junior's Revenge you are the ape's son. You must unlock your Dad's cage and rescue him by stealing the keys from Luigi. That would be a simple

matter except for Luigi's trained pests: ZuZu attack birds, and the vicious (and hungry) Vinegators.

The game has four levels. You must climb, swing, and jump your way through vines, islands, chains, a trampoline, and Luigi's hideout. You can get points by jumping over the ZuZu birds and Vinegators, by pushing the keys into the locks, or by picking a fruit growing on a vine and dropping it on one of Luigi's critters.

A bonus timer gives you points whenever you finish a screen, and at

**"Junior's Revenge
is Computerware's
sequel to the popular
Donkey Kong
arcade game."**

every 10,000 points you get another Junior.

The graphics in Junior's Revenge are colorful and very well done, with one exception. On the chain screen, Junior must push keys up several parallel chains into their locks to unlock Daddy's cage. It is hard to see the ZuZu birds and Vinegators, since they blend in with the chains. Aside from that screen, I am impressed with the graphics and animation in the game. The sound effects are good, too.

Small touches make this a professional game. The cartoons between each screen are indicative of the game's polish. One of these has Junior pushing Daddy off the screen to safety while being chased by Luigi. Junior then turns around and chases Luigi off the screen to the next level of the game.

The manner of selecting either a practice game or a real game is pretty clever, too. Junior is on a platform, with a box on each side. The boxes are labeled "Demo" and "Game." To play a practice game you make Junior walk over to the demo box and jump onto it.

The practice mode is an interesting game down, or giving you extra Juniors, or both, the demo mode makes you almost invincible. In a practice

game you can walk or climb right through the ZuZu birds and the Vinegators, but you still die if you fall off a vine or the bonus timer runs out. This allows you to "play" all four screens without an unreasonable amount of practice. (No matter how much fun a game is, I don't like to spend sixty-odd hours in front of the computer just to catch a glimpse of the third screen.)

With the proper joystick you can be reasonably successful at Junior's Revenge. In this case, you should use either an Atari-type joystick or one with a spring return to center. Several spots on the trampoline screen are well-nigh impossible to get through with a regular-issue Radio-Shack joystick. Though this game might not be reason enough to upgrade your computer to 32K, it could be reason enough to get a different joystick.

Junior's Revenge is a fine game. Not only is it playable, it is fun and it has excellent graphics and good sound. It won't be left gathering dust on my shelf for some time.

— Gary Teter

Black Sanctum

Mark Data Products
24001 Alicia Pkwy., No. 226
Mission Viejo, CA 92691
\$24.95 cassette



Black Sanctum starts by describing your mission: to win the game you must find and destroy the forces of Black Magic. The adventure begins on rugged mountains covered with pine trees; you can see a cabin (in wonderful high-resolution) in the distance.

You will eventually make your way to the St. Sebastian Monastery where the main portion of the adventure is played. The monastery is a maze with

a library, corridors, an alcove, a locked door, stairs, a secret passage, a caretaker, etc. I won't tell you how the adventure is solved, but I will say that there is a solution. By using logic and imagination the adventure can be successfully completed.

Here are few tips: never use anything unless you have to; always fully examine an object to make sure you haven't missed something; if you know you have a problem solved but can't find the correct wording, keep trying; make a map as you go. Having two people trying to solve an adventure makes it easier, since one might overlook something the other person will see.

This was my first adventure program, but it won't be the last. Adventures can be a little frustrating at times, but they are a nice change of pace from the shoot-'em-up arcade games. Black Sanctum is a very good adventure. It even includes a routine to save the game in progress so it can be completed later. I recommend it for anyone, especially as a first adventure program.

— William Estep

Nova Pinball

Bumblebee Software
P.O. Box 25427
Chicago, IL 60625
\$20, cassette



Ready for a good game of pinball? So is your Color Computer — if you buy Nova Pinball. This machine code simulation offers most of the features and action of a real pinball game.

Nova's claim to fame lies in its ball action. The ball moves smoothly and follows a realistic trajectory as it bounces off obstacles. The speed is

good. The sound effects, while not spectacular, are adequate.

Nova has many of the same targets and bonuses as any pinball machine. There are bumpers, thumpers, and ball slots. The bumpers and thumpers are both worth 10 points and the slots 100 points. Bonuses of double and triple score are given for getting the ball through multiple slots. The slots are also used for toggling the ball kicker in the left alley gutter. If you get a triple bonus on your last ball, you get a bonus ball.

The C key is the coin slot, and the P and S keys control the plunger. You can use the P key to vary the plunger's force when it hits the ball. The left and right flippers are controlled by the Down Arrow and Clear key.

Nuts and Bolts

The action of the bumpers and plunger is realistic. (I was occasionally tempted to shake my Color Computer like I would a real pinball machine.)

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There were a couple of things that could have been done better, however.

First, the flippers aren't as responsive as they should be. Many real pinball machines have the same problem, but I don't think this is a desirable effect.

The ball also has a tendency to take off at high speeds towards the exit. Usually the quick exit is due to ball action off the bumpers, all part of the game. Sometimes, however, the ball makes up its own mind about when to take a dive. This wouldn't be as much of a problem if the flipper response were improved.

Nova's graphic representation of a pinball machine rates only fair. The screen does look like a pinball machine, but the level of detail is not as good as it could be.

Nova's documentation is short, just one sheet, but it covers more than enough to get started.

Nova Pinball is reasonably priced. If you like playing pinball, think about adding it to your software library.

— Richard Uglum

Ockywocky

Prickly-Pear Software
8532 E. 24th Street
Tucson, AZ 85710
\$24.95 cassette
\$29.95 disk

Have an itching to step in James Bond's shoes for a few hours? Try this game: Ockywocky.

The object of the game is to find Ockywocky, an agent of the evil Dr. Glimm. There are two ways to win: name Ockywocky (out of 32 suspects) or find the combination to Dr. Glimm's vault (it holds a document that tells who Ockywocky is).

How do you do it? You travel around the world on a budget of \$3500 and with 10 days (on the lowest level). You contact informants for tips on Ockywocky, or for one of the three numbers in the vault code. Making an accusation lets you try to identify Ockywocky.

The manual lists the 32 suspects and gives some information about each person: where in the world they are, their names, whether they're an agent

or a bureau chief, their sex, age, height, weight, eye color, and hair color.

The informants give you *information* such as "Ockywocky does not have black hair," or "Ockywocky is ambidextrous" or "Ockywocky is an agent." From these clues you can narrow the list of suspects. Just be sure you know who Ockywocky is before you accuse him, or you lose the game.

The manual was well-written and really helped me understand the game. On the back is a time-travel chart for a quick glance at the mileage and fares between the different cities.

— Chris DeSimone



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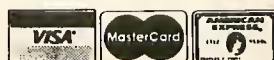
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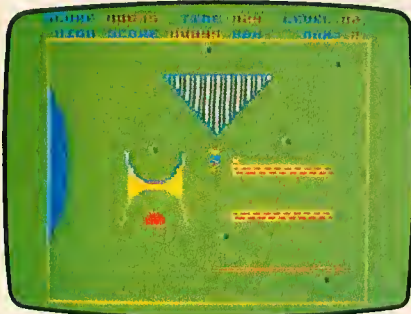


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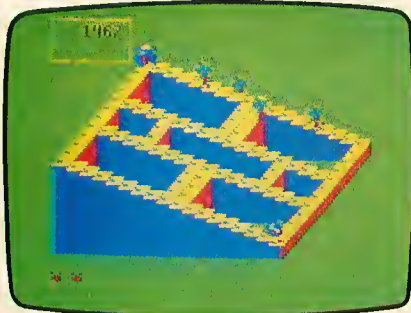


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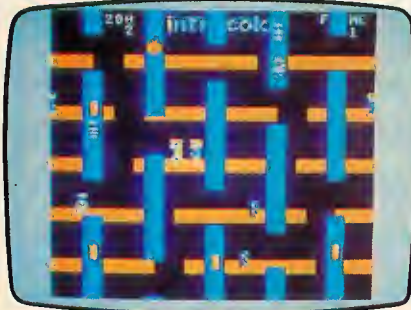
Dodge Ball, p. 64



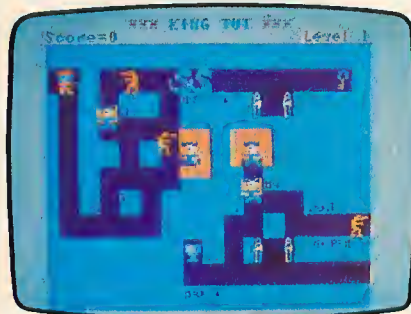
Crystal Castles, p. 64



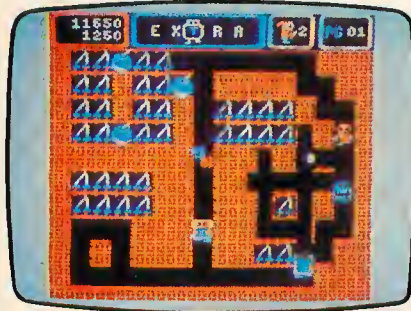
Candy Co., p. 64



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Mr. Dig, p. 65



GIMME SOME GAMES!

I'd had enough. Enough of deadlines, traveling to computer shows, phone conversations, and far too many conferences. My Color Computer hadn't been turned on for almost two weeks. I burst into Review Editor Tom Juergens' office and said, "Gimmie some games."

With a packed box under my arm I left Tom's office as abruptly as I had come in. "No calls," I mumbled to Kristi on my way through the reception area.

Back upstairs I locked my door behind me, put my music on loud, and plugged in my joystick. Enough of business, enough of magazines, enough of serious thinking. I got me some game-playing to do.

— K.L., *Color Staff*

Dodge Ball

by Lynn Yarborough and Mike Smith
Spencils Software
709 Spencer Street
Prattville, AL 36067
(205)365-3533

32K
\$24.95 cassette
\$29.95 disk

I was able to drink my morning coffee while playing Dodge Ball. The game is a cross between good old-fashioned schoolyard dodgeball and Pong, the original arcade game where a ball bounces off walls.

In one-player Dodge Ball you are a little man who, using your joystick, is trying to dodge a not-so-smart bouncing ball. There are obstacles, extra-point markers, and multiple action levels. But even so, they are not enough to hold interest for very long.

In two-player Dodge Ball one player is the man and the other player is the ball.

Crystal Castles

ThunderVision
P.O. Box 30012
Grand Junction, CO 81503
(303)245-4208
32K
\$24.95 cassette
\$29.95 disk

I must be on a roll: Crystal Castles is another fun game in a simple package. You are a bear running around various castles picking up as many gems as you can. Trying to stop you are Gem Eaters, Berthilda the witch, moving trees, and a swarm of bees. Your only aid in avoiding obstacles is getting and wearing The Hat, which enables you to kill the witch. If you happen upon some honey during your gem-gathering spree, stop and eat it for extra points. But don't stop for too long or the bees will get you.

The graphic screens in Crystal Castles are nicely done. They are three-dimensional cube-like structures. The gems, like Pac-Man dots, are laid out in paths along the castles.

Candy Co.

Intracolor Communications
P.O. Box 1035
East Lansing, MI 48823
(517)351-8537
32K
\$34.95 cassette and disk

Candy Co. is a delightful game. It's fun and has a host of characters that educate as the game is played. Don't worry, Candy Co. is not just for kids. We oldsters can enjoy Candy Co. without letting Intracolor's good lessons stand in our way.

Without pigeonholing Candy Co., the game action is similar to a combination of Donkey Kong and Frogger, but similar is as close as it gets to imitating anything. In the one-player game you are Candy Dan; when two play, the other player is Q.P. Doll, a faceless beauty who sometimes is the object of Candy Dan's rescue attempts and other times is Dan's partner in his fight against the bad guys and their terrible devices.

There are three types of playing screens, each with its own challenges. Basically, the action has you jumping from moving conveyor to moving conveyor knocking off bad guys, picking up candy, and avoiding cherry bomb:

An example of Intracolor's educational orientation is in the game's documentation: "Cherry Bombs: You should never play with fireworks. If you touch a cherry bomb it will explode..."

Two-player gaming is in the cooperative spirit rather than combative. The two players fight together for a common end. "In a two-player game, both players contribute to the same score and both players draw from the same supply of Thinking Caps." Thinking Caps are another fine example of a wholesome game-playing attitude. Rather than kill one player and call in its reinforcement, if Candy Dan gets knocked off the conveyor belt you lose a Thinking Cap rather than a life. And, of course, Thinking Caps are something to be proud of collecting. Candy Co. is good clean fun for children of all ages.

King Tut

by Bob Burgess
DSL Computer Products
P.O. Box 1176
Dearborn, MI 48121
(313)582-8930
32K
\$29.95 disk

I didn't enjoy playing King Tut, especially when I compared it to Mark Data's Tut's Tomb.

You are an explorer in a cave filled with treasures and demons. The program, written in Basic, feature nicely-done graphics, but sluggish reaction to joystick movement. I died more than once while waiting for the joystick to respond. Also, whenever the explorer is stopped by a demon the program takes too much time to let you continue play.

A longer-than-necessary response time may not be important in a text game, but in this shoot-'em-up game, it's deadly.

Mr. Dig

Computerware
Box 668
Encinitas, CA 92024
(619)436-3512
32K
\$27.95 cassette
\$30.95 disk

I didn't like Mr. Dig until I got into sync with the game. Although simple

in appearance, Mr. Dig screams for the application of a thoughtful gaming strategy to do well.

Basically, the player travels around a maze eating cherries and keeping a good distance from the Meanies. Besides cherries for eating, there are apples for knocking Meanies down. How? Make an apple fall by digging the ground out from under it. Then trick a Meanie into moving under the apple just before it falls. The result is one less Meanie to worry about.

The game performs well on two levels. At its simplest, it is an easy-to-learn Pac-Man type game for very young children. Apply a little brain power and it becomes a challenging game for all.

Baseball

by Dale Lear
Radio Shack
One Tandy Center
Fort Worth, TX 76102
16K
\$24.95 ROMpak

It's a good thing I didn't begin my day with Baseball, or I wouldn't have gotten to any of the other games. Radio Shack's Baseball is a great program. Congratulations to Dale Lear, Baseball's programmer. Not only is the play good, but Dale's attention to detail is superb.

The game begins, aptly enough, with the National Anthem. I'm sure the umpire shouted, "Play ball," but the crowd drowned him out. My team, The TCCMs, is home team playing against a bunch of stringers managed by my computer, The CPUs.

"Go soak your circuits," shouts my pitcher. I quiet him down, but inwardly smile at his spirit.

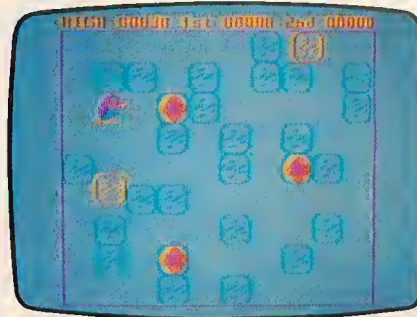
"Save it for the mound, kid," I say and pat his butt. He shoots me an aw-shucks look and spits a stream of brown juice at a mosquito on the lip of the dugout. Nice shot.

My team takes the field. The crowd is on their feet. The boys eat it up. They take to their positions after a few warm-up tosses. Ernie, my pitcher, checks Otis, the catcher, for the sign. Ernie is pointing his joystick down and to the left: curve ball, inside. The batter swings. The crowd gasps. Chaucer, at third base, takes the ground ball, sets and throws to Janis (women's lib

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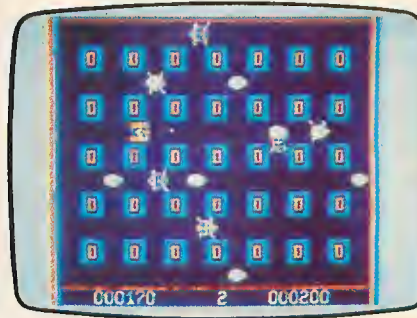
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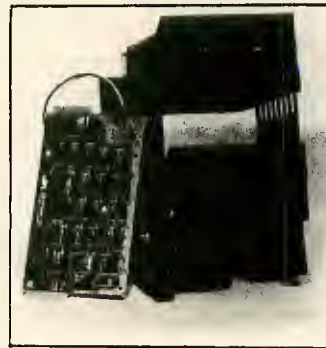
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y'know) at first. Out by a step. The crowd roars again. A few more stellar plays by my team and the teams switch positions.

I tell my lead-off batter, Chicken Paterson, to bunt down the third base line. He lays one down beautifully and is called out at first on a close play. I run from the *dugout*, madder than a runner with a pulled hamstring, straight for the ump.

"Whatareyoublind?" I yell, my nose half an inch from his.

"Nope," he says exhaling a long pull of garlic. That's dirty pool, chewing on garlic before a game. My knees buckle. I can't back down. Chicken was safe, I know it.

"Well, if you're not blind, you must have been sleeping."

"Nope, weren't sleeping neither. They had your boy by half a nanosecond."

Nanosecond. Remembering the old saying, you can't argue logic with a computer, I kick some dirt on him and walk back to the dugout. I can hear the radio and TV guys talking about the veins popping up on my neck. Billy

Martin taught me how to do that. I can make 'em do that at will now.

If you've gotten the drift that Color Computer Baseball drew me into its fantasy hook, line, and pine tar, you're right. Your game software library would be incomplete without this gem.

As the defensive team you are able to control the type of pitch thrown, who fields the hit ball, and which base the ball is thrown to. On offense you can determine if your batter is left- or right-handed, how to swing at the ball (bunt, controlled swing, drive the ball, or go for the "cheap seats"), and base running (advance, steal a base, stay put, slide, or retreat). You can even have a run-down between the bases.

The computer can randomly assign players and batting averages, or you can do so before the game starts. If you determine the line-ups, the computer will respect the status you attach to the players. You could, if you like, create a team of Babe Ruths and George Bretts. You can play the computer, or another human.

No matter how you play Baseball, the important thing is that you play Baseball.

Ice Bird

by David A. Kalman
Crystal Software
6591 Dawsey Road
Rock Creek, OH 44084
16K

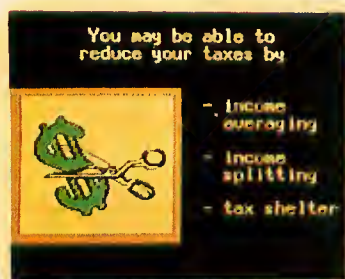
\$24.95 cassette

\$28.95 disk

I finally stopped playing Baseball and loaded this Ice Bird game. Big mistake. Ice Bird is addicting, very different, and Clouds of fun.

You're a penguin in an area filled with ice cubes. Three of the ice cubes have diamonds in them. The object is to push the cubes together so all three diamond cubes are in a row. Sound too easy? You're right — there are pursuer cubes as well. As you waddle about moving cubes around, an ice block will begin to flash. After a few flashes it takes on a life of its own and starts to move. That's okay except its sole purpose for living is to mow you down.

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You defend yourself against the pursuer blocks by smashing other cubes into them. You move your cubes around the arena by leaning against them and pressing the joystick fire button. As you get better the action becomes more difficult. Ice Bird is a game you'll play over and over again.

Pengon

by Markus Foti
Spectral Associates
3420 S. 90th
Tacoma, WA 98409
(800)426-1830
32K
\$24.95 cassette
\$28.95 disk

Lo and behold, Spectral Associates has a similar game, called Pengon. Spectral's documentation says there is a popular arcade game (in arcades, of course) called Pengo on which Pengon, and presumably Ice Bird, is based. I probably should offer a bit of an explanation. I am almost totally ignorant

of what is popular at arcades. I hardly ever go to them. Why should I? I have a Color Computer. The worth of an arcade game for the Color Computer should not be based on how well it imitates a game anyone can play at an arcade; it should be measured by how well it plays on your Color Computer.

I didn't like Pengon as much as Ice Bird. The playing screen is smaller. The bad guys are not mutant ice cubes — they are sea lion beasts. Of course, no complaint about that, but the beasts appear all at once from out of nowhere. The placement of the beasts is a function of a random routine in the program; it is totally illogical. Many times I was doing quite well pushing blocks of ice around when all of a sudden I was surrounded by five sea lions! I had no time to set up defenses or counterattack. It's one of those unfair advantages we used to allow computer games, but today game programming is so good that losing a game because

a programmer took the easy way out is unacceptable.

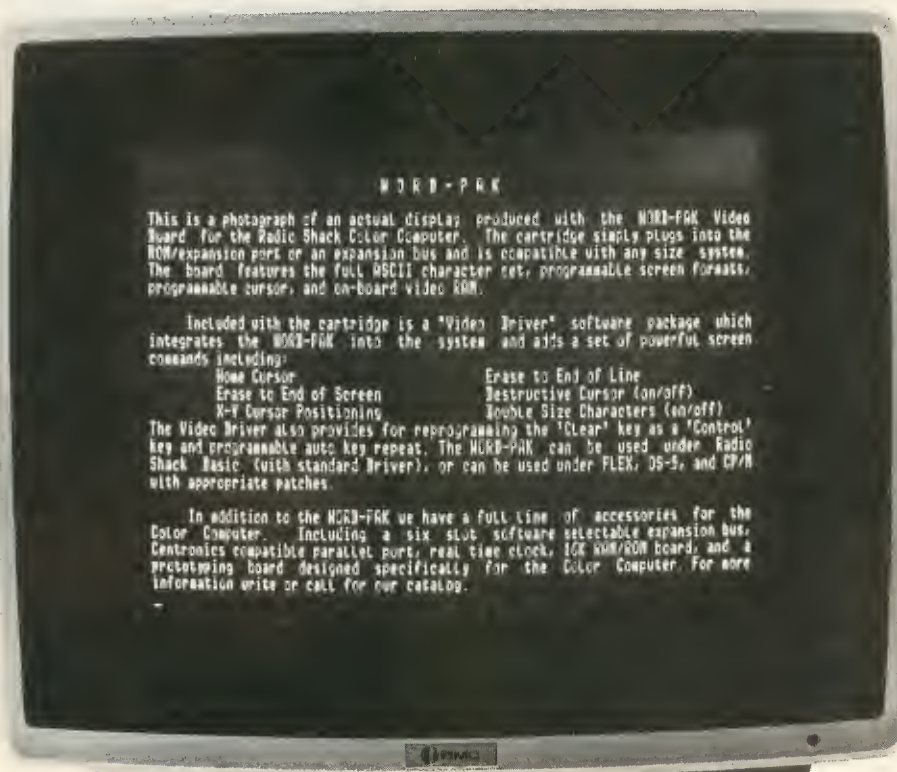
Spectral Associates has produced many fine games. Pengon is not one of them.

Turtle Attack

Triple-C Software
210 Hilltop Drive
Ellisville, MO 63011
16K
\$21.95 cassette

Turtle Attack has nothing to do with Logo. It is a simple game that happens to be a lot of fun to play. It features a grid that you roam, driving a tank. Your enemy are gigantic turtles. You shoot them with your tank's 60mm Howitzer. The turtles lay eggs that must be run over (your Howitzer can't blast the thick-shelled eggs) before they turn into more bloodthirsty killer turtles. Gotta go, here comes another nasty turtle.

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Color Panic

Spectral Associates
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(800)426-1830

32K

\$24.95 cassette

\$28.95 disk

Although Color Panic uses ladders and multiple level screens, it is not at all like Donkey Kong. The scenario has you on a distant planet trying to stay alive while the crew on your spaceship completes its mission. You are stranded because the planet might have infected you with a deadly bacteria you don't want to carry back to the ship.

The creatures native to the planet aren't happy with your presence. To combat them you must dig a hole on any level except the lowest, get them to fall in, and then refill the hole before they reemerge in a more dangerous form.

Digging the holes takes four shots of your hole digging gun. Filling them also takes four shots. I liked both the idea and the spaceman graphics. The game fell short of my expectations because of the program's sluggish reaction to joystick movement. I tried both the old Radio Shack joystick and the Deluxe version, but didn't get any better reaction from the game.

Beam Rider

Spectral Associates
3420 S. 90th
Tacoma, WA 98409
(800)426-1830

16K

\$24.95 cassette

\$28.95 disk

No matter how much I try to be "professional" about it, it's difficult for me to have anything but a sheepish grin on my face when someone comes in my office as I clutch a joystick and sit on the edge of my chair in hot pursuit of an alien.

"Working," I say.

"Sure," they grin, wondering who put me in charge anyway.

Well, Beam Rider is a game I can play in my office with pride. There are no aliens to shoot, maim, or bury, and the screen graphics have that *adult game* look. Instead of a who-put-you-in-charge look, Beam Rider earns me,

"Gee that looks neat, how do you play?"

You get a screen filled with tiny boxes. Using the joystick you try to clear the board of the boxes by running them over. If there is a gap between you and a box, pointing your joystick in the proper direction casts a beam which acts as quick transport.

When running over consecutive boxes you move quickly. As you enter a boxless area you move slowly. There are all sorts of help and hinder objects on the board to provide extra challenge to the game.

No matter how well you do at Beam Rider, you'll always be able to improve. That translates into lots of good playing time.

Castle Ragoona

by Chris Pelley
Family Computers
4047 Bee Ridge Road
Sarasota, FL 33502
(813)921-7510

16K

\$19.95 cassette

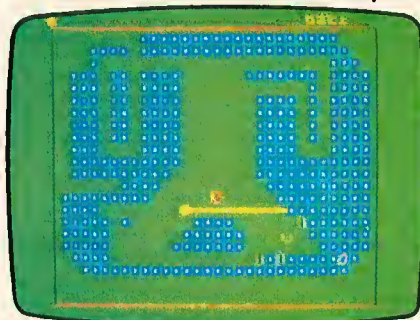
Right off the bat this is a good deal. Family Computers gives you a second game on the flip side. Both games are adventures, and both are written in Basic. And, most importantly, both are pretty good.

Although not an expert adventurer, I do enjoy an occasional tangle with the evil spirits resident in most adventure games. Ever since Steve Bjork's graphic adventure masterpiece, Sands of Egypt, I haven't been able to look at a non-graphic adventure. Castle Ragoona is somewhat of an exception. It does offer a few low-resolution graphic screens, and throughout the adventure graphically displays a room map, but that's it.

Even so, Castle Ragoona does as promised by providing a challenging adventure game for the adventure newcomer.

Experienced adventurers (good at it or bad at it) like myself, jaded by high-quality, high-resolution graphic adventures, might not be able to get excited about Basic graphic adventures. But novices, or adventure-curious newcomers, will definitely find the tape's flipside adventure, Enchanted Village, a delight. It's a much easier adventure to play, yet will be chal-

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Castle Ragoona, p. 70



Sea Quest, p. 73



Calixto Island, p. 73



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...one of the best programs for the Color Computer I have seen...

— Color Computer News, Jan. 1982

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The 51 × 24 display is clear and crisp on the screen. The two high density modes are more crowded and less easily readable, but they are perfect for showing you the exact layout of your printed page, *all on the screen at one time*. Compare this with cumbersome "windows" that show you only fragments at a time and don't even allow editing.

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One outstanding advantage of the full-width screen display is that you can now set the screen width to match the width of your printed page, so that "what you see is what you get." This makes exact alignment of columns possible and it makes hyphenation simple.

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— The RAINBOW, Jan. 1982

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lenging to the newcomer. It even supplies a map, but of course you have to find it.

Bible Story Adventure

Sugar Software
2153 Leah Lane
Reynoldsburg, OH 43068
(614)861-0565

32K

\$19.95 cassette

\$24.95 disk

On to a different type of game. Bible Story Adventure is not a typical adventure game. Based on the Old Testament, the program covers the Adam and Eve, Noah's Ark, Abraham and Isaac, Moses and the Exodus, and David and Goliath stories.

Unlike other adventures I've played, Bible Story does not allow for mistakes — but if you get stuck, a plea for assistance (type HELP) will provide the needed hints. It is not a true adventure game and probably should be called something like Bible Story Lessons. But where it fails as an adventure game, it excels as an educational tool for teaching children about the Bible.

Each segment is depicted by a graphic scene with the various figures in the picture noted by text. In the first scene are labels for Adam, Eve, Snake, Apple, Garden of Eden. You are taken from scene to scene via story narration that uses large easy-to-read scrolling letters. Sound, voice and special effects are scattered through the stories.

Once considered an educational lesson rather than an adventure game, the drawbacks become less important to the program's worth. For instance, entering a wrong answer does not put you in a situation of your own choosing, as would an adventure game. Rather, you are simply told (through graphics and sound) that your input was incorrect. Trial and error is the only way to get where the program wants you to go. Because of the unforgiving nature of the program, children playing by themselves might become frustrated (no hints are given after the wrong answer is rejected). Bible Story Adventure is a game to be played by parent and child together. Then parents can offer their own commentary while both parent and child try to determine what answer the computer will accept.

Inatak

DSL Computer Products, Inc.
P.O. Box 1176
Dearborn, MI 48121
(313)582-8930

16K

\$24.95 cassette and disk

Inatak is the first space invaders game I've seen in quite some time. The innovations to the genre necessary to justify yet another space invaders game are not present in Inatak.

The game is fairly difficult to play. The main difficulty is not the challenging aspect of playing the game; it is one of those unfair difficulties: the bombs dropped in the first screen are so small they are difficult to see and therefore difficult to avoid.

As the spaceships hover above a ground-based laser cannon, your mission is to shoot them down. Some of the good points: There is a launch base blocking your movement from one end of the screen to another. To get from right to left (or vice versa) you must scroll your cannon off to the right to

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reappear on the left: a nice twist. The better you shoot, the fewer ships there are in the sky to drop bombs on you. So, if you find Inatak too easy, allow the ships to launch unmolested for a while and then start shooting.

After downing 20 ships you are advanced to level two where hopping aliens try to crush you into oblivion. Eliminate 20 aliens and they call out the big ships to try to stop you. The ships drop bombs on you that may not explode the first time you hit them, so firing from one place will not do, here in level three. To successfully fend off this attack, besides shooting falling bombs, you have to hit the big ship six times exactly in the middle. I never successfully made it through the third level, so I have to rely on the documentation for what happens afterwards. "So the game continues until you are destroyed." Gulp.

Space invaders fans looking for another space invader challenge will undoubtedly enjoy Inatak, as will gamers who find normal game fare too tame.

Sea Quest

by Stephen and Kathy O'Dea, and Bob and Dollie Withers
Mark Data Products
24001 Alicia Parkway, No. 207
Mission Viejo, CA 92691
(714)768-1551

32K

\$24.95 cassette

\$27.95 disk

While we're on the subject of adventures, let's look at a few great ones. Sea Quest is the first of four from Mark Data Products that will satisfy old-timer and novice alike. If Sands of Egypt tickled your fancy, Sea Quest, Shenanigans, Black Sanctum, and Calixto Island will have you hysterical. But let's not jump ahead: first Sea Quest.

Most adventures take you deep into the bowels of a castle, or along lonely dirt paths, or into underground caverns. Sea Quest has you adventuring under water (glub, glub). Oh sure, it has underground caves and a lonely cottage, but bringing you fathoms down is a twist I've never seen done before.

The plot has you searching for treasures; most adventures do. And without getting into unnecessary detail about what you find and what evils lurk waiting for the unwary, suffice it to say that the adventure is well-planned and challenging. The game is great; the graphics will have you pointing like a tourist.

Calixto Island

by Stephen and Kathy O'Dea and Bob and Dollie Withers
Mark Data Products
24001 Alicia Parkway, No. 207
Mission Viejo, CA 92691
(714)768-1551

32K

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We reviewed the original version of this adventure in our January, 1984 issue. Calixto Island is no longer a black-type-on-green-screen game. It has become a graphic wonderland.

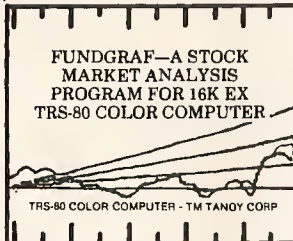
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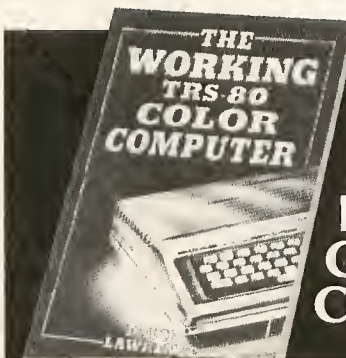
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Our reviewer, Charles Holland, took exception to the lack of help and assistance offered by the game's authors. In some circles that sort of help is called "handholding." Others would be less kind and call it "babysitting." Well, none of that cub-scout style assistance is available with the newest version of Calixto Island either. Good thing, that.

The adventure opens in Professor Lagarto's study. In it is a roll-top desk, oriental rug, antique table, attic staircase, and a clock. To give you an idea of the excellence of all Mark Data graphic adventures, take note of the attention to detail. The oriental rug is not just a rectangular color on the floor, it has a pattern and two different colors. The table is not just a table, but an antique table, and not just an antique table, but a Queen Anne style antique table.

The attic staircase is blue. On its middle section is a rug. What attention to detail! I looked for worn-out spots from staircase traffic but didn't see any. The roll-top desk looks like a closed roll-top desk. I saved the best for last. The wall clock is not just a bunch of numbers and hands on the wall. It has a moving pendulum. I'm sure if I stayed in the room long enough a little cuckoo bird would tell me what time it is.

It is this kind of attention to detail that exemplifies the quality of all Mark Data adventures. If you haven't tried adventure gaming yet, do so with one of these. And you beginners — don't get frustrated so easily. If the games weren't challenging, they wouldn't make you feel so good at the end. If you ever get to the end.

Shenanigans

by Bob Withers and Stephen O'Dea
Mark Data Products
24001 Alicia Parkway, No. 207
Mission Viejo, CA 92691
(714)768-1551

32K

\$24.95 cassette

\$27.95 disk

Didn't this game bring back a few memories! It begins in a small efficiency apartment. (As usual the graphics are outstanding.) I search the room and

its furniture and then leave, or at least try. Suddenly at the bottom of the stairs (I'm at the top) is my landlord, and he won't let me by because I haven't paid the rent. While in the apartment I found a wallet. GET WALLET, followed by PAY LANDLORD doesn't get me anywhere. As I feared, the wallet is bare (or is that the cupboards?).

**"If you like
adventure games,
just close your eyes
and pick a few."**

I reach back into my not-too-distant past and try RUN PAST THE LANDLORD.

Didn't work. How about KILL LANDLORD, or (a la Eddie Murphy) CILL LANDLORD? No go. Finally, maybe years later, I get past him. Don't even dream that I'll tell you how I did it, just be aware that the adventure does not stop at the top of the stairs. It goes on and on and on and then some. Shenanigans is good fun (say that with a brogue).

I thought I had one more game to go, Black Sanctum, the last Mark Data graphic adventure. It, like Calixto Island, is a re-release. This new version has had graphics added to it. Then it was brought to my attention that we have a review of it already (see page 63). But let me get my two cents in on Black Sanctum.

Whenever a reviewer looks at a group of similar games, whether they be similar in type or plot, the impulse is to anoint one as the best. That is an impossible chore.

The difference between the four graphic adventures is the story line. Each one is artfully illustrated. Each plot is skillfully woven. They are like reading books by favorite authors. How many wars has Hemingway put me through, or how many times have I awoken bloody and beaten in a Robert Ludlum novel? I couldn't pick a favorite Hemingway story without feeling I was relegating other favorites to less-than-great status.

The same is true with these adventures. If you like adventure games, just close your eyes and pick a few. If you're new to the genre, try one. Oh, and

have patience with yourself; you're not as dumb as you're going to feel for awhile.

And now back to the phones, conferences, deadlines, and computer shows. It will be hard. No one will know, as I walk past their booth, that I saved the world from all sorts of demons and bad aliens. Only I will know, as will you, that the world is a little safer now. We will all sleep well tonight. ■ ■ ■

I WANT SOME TOO...

I overheard Kerry demanding some games to play from Review Editor Tom Juergens. Not to be outdone, I pushed the door open and got some for myself. Here's what I got, and how I liked them.

— L.R., *Color Staff*

Travelin' Toad

Prickly-Pear Software
8532 E. 24th St.
Tucson, AZ 85710
(602)886-1505
\$24.95 cassette
\$29.95 disk
32K

This is Prickly-Pear's version of the arcade favorite, Frogger. It's a good, solid, fun-to-play game. The little frogs look like little frogs, the fast cars and trucks really whiz by, and I'd rather not say how long I played this game.

The frogs are controlled with the four arrow keys, which is fine with me; I have problems with joysticks. The keys respond well to pounding — my frogs never died because of lag time although they often died because of my abysmal reaction time.

My only gripe is with the music. I couldn't figure out a way to bypass (or shorten) the death march, so had to listen to it every time before a replay.

Monsters and Magic

Prickly-Pear Software
8532 E. 24th St.
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(602)886-1505
\$24.95 cassette
\$29.95 disk
32K

Monsters and Magic is a dungeons and dragons game without graphics. I know, I'm jaded, but a Carrion Crawler just doesn't seem dangerous or thrilling when it is only a word on the screen.

The game's duration and difficulty level is determined by the number of monsters you choose to fight (from 1 to 50). Your final goal is to have the skill and strength to fight the dungeon lord.

I was unable to map the game's terrain — it seemed random, and made all the trouble I encountered and gold I found less meaningful. I kept or lost my life in the program according to the whim of a random-number generator. That doesn't seem quite right either.

The pronouns in the program irritated me most, though. That's right, the pronouns. I am a woman, and I don't like being referred to as "he" or "him." And a cute little female pixie kept popping out of rooms, falling in love with me, and giving me gold pieces.

The game's designers could certainly have made Monsters and Magic non-gender specific. Simply rephrasing the text to eliminate pronouns would have done the trick.

Devious

Spectral Associates
3420 S. 90th St.
Tacoma, WA 98409
(206)581-6938
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\$28.95 disk
32K
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Devious is a shoot-em-up game and requires a joystick to play.

Devious plays well enough — you shoot at anything that moves down the screen, and try to avoid being hit.

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There are two modes of shooting. One uses the joystick button alone, and the other uses the joystick button and the Z and X keys.

The graphics are nothing to write home about, but they are functional.

There are better games for the Color Computer, and there are worse. I probably wouldn't choose to play this one, but if nothing else was around...



Super Color Biorhythms

Armadillo Int'l Software

P.O. Box 7661

Austin, TX 78712

\$19.95 cassette

16K Extended Color Basic

Super Color Biorhythms can predict your future mental, emotional and physical rhythms. The theory of biorhythms postulates that the body has certain natural rhythms, or cycles, that can be predicted from the moment of birth. Since each function is supposed to follow an exact cycle, your mental, emotional and physical cycles can be predicted for any day in the future.

Super Color Biorhythms plots curves of these cycles in high-resolution graphics on the screen.

Super Color Biorhythms comes on tape and consists of two separate programs. The first program, written in Extended Color Basic, is named Biorhythm. The second, written in machine code, is titled Graf. (Disk users must power down and remove the disk controller before loading either program.)

When you run the program, you will be requested to enter your birthdate, the date to start plotting the curves from, and the number of days that you want the chart to cover. The program takes about five minutes to plot two months.

The graphics display is well done. It consists of a grid indicating days, a center line, the three rhythm curves, a date and a legend. The legend displays each of the rhythm names in the same colors with which they are plotted. On my screen, the physical curve is white, the emotional curve is blue and the intellectual curve is maroon. Since the three curves are identified by color alone, a color TV or monitor is a must.

The date shown at the top of the screen indicates the grid line just crossed by the three rhythm curves. After the first 14 days have been displayed, the screen scrolls from right to left to plot the remaining days. You can stop the scrolling by pushing the Shift and @ keys and study the screen at your leisure.

The graphics and text are clear and easy to read, and the screen is not crowded. My only complaint with the display is that just one date is indicated under the grid. I'm too lazy to figure out what the other grid lines mean. They should each have been identified with a date.

The program comes with a 4-page booklet that explains loading procedures, and how to enter the dates properly. The booklet has an interesting explanation of biorhythms, and it explains the significance of the curves at various points on the chart. Armadillo treats the subject in a light-hearted manner, making no claims about the validity of the subject. The booklet also states that defective cassettes will be replaced if returned within 30 days.

I think Super Color Biorhythms is well-written. The data entry routines and the graphics are of the professional caliber that you expect when you buy a program. At \$19.95 this program is better written than some that sell for two or three times as much.

— Gary W. Clemens

Bits On Books

Here are a few short notes on books recently received:

TRS-80 Color Computer and MC-10 Programs by William Barden, Jr.: Radio Shack, \$5.95, paperback, 184 pages.

A collection of programs on many topics, from games to business to tutorial, all programmed to run on the Color Computer and MC-10. Each includes "how to use" instructions, a short section on how the program works, and background facts about the program itself, or the topic the program deals with — programs as only Bill Barden can produce them!

Computer Art and Animation by David D. Thornburg: Addison-Wesley Publishing Co., \$12.95, paperback, 168 pages.

The book is a user's guide to Color Logo for artists interested in computer graphics. This book introduces computers, computer graphics, and Logo to artists who have never used any of these before. It uses a non-threatening approach for non-computerists, and shows, step by step, how to approach Logo and develop graphics. It is not aimed at children.

Color Computer Applications by John P. Grillo and J.D. Robertson: Wiley Press, \$10.95, paperback, 134 pages.

The book is written for programmers, trying to inspire them to develop and use computer graphics well. It presents graphics as an art form, and discusses development through top-down programming style and via presentation of creative graphics programs. The book moves from art to business to practical to game graphics. A good idea, fairly well done.

Thrilling Games For The Tandy Color Computer by Hal Renko and Sam Edwards: Addison-Wesley Publishing Co., \$5.95, paperback, 145 pages.

This book contains 31 games, eight requiring Extended Basic. The games range from logic through action, adventure and traditional. A few present simply interesting visual or mental concepts, and aren't games at all. Most are very short. Some interesting ideas. No saving instructions — a certain amount of user competence expected.

— D.M., Color Staff

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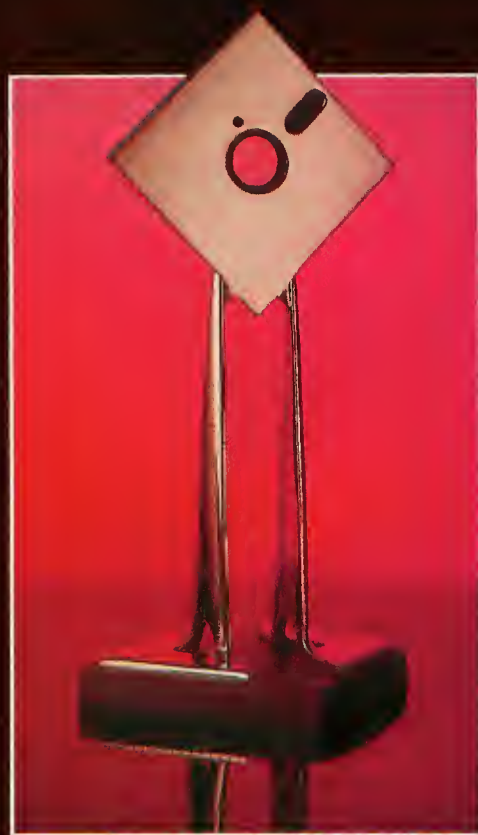
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The manual shows the screens you will see when you run the program as well as some useful information on aligning disk drives. Although you can run the DDA program without reading the manual, I found the tests much more meaningful after I had studied the manual.

The DDA program is the same for both the single- and the double-sided versions of the package, but the Dysan calibration disk supplied with the program is different for the two.

In all, eight digital tests are included with an overall parameter change selection, and an analog alignment aid section.

The possible selections from the main menu are:

- 1 Clamping test
- 2 Quick test
- 3 Spindle speed test
- 4 Index hole timing test
- 5 Alignment sensitivity test
- 6 Head alignment test
- 7 Directional seek test
- 8 Head rotation test
- A Analog alignment aid
- C Change test parameters

The screen immediately displays another menu for the test you have chosen; the commands generally available include the following:

- D Select test drive
- E Exit to main menu
- H Select head
- S Start/stop test
- T Select test track

The clamping test provides information on both the condition of the disk hub and the drive spindle shaft and bearings. If the shaft is bent or the bearings are damaged, the disk will rotate eccentrically.

In this test, as in all the others, the results are displayed on the screen. Here the display consists of sets of vertical bars above and below a horizontal bar. If the bars above and below the horizontal are equal, the disk is properly clamped and aligned about the spindle; if there are missing bars above or below, the disk may be rotating unevenly. I say may, because if the drive is seriously out of alignment, the test can be misleading. The drive may need pre-alignment before the results of this test can be taken seriously.

The quick test is the most useful test on the disk. In about 30 seconds, this

choice checks spindle speed, index hole timing, disk clamping, head alignment, alignment sensitivity, head rotation, and directional seek variations. The display then gives the results as pass, marginal, or fail for each parameter.

Unlike the other tests, this one cannot be interrupted once it has begun. In all the other tests, pressing the (S)top or the (E)xit key will end testing and get you back to the menu for further choices; this test runs to the end.

I use the quick test once a week or so, whenever I am about to save anything important. Naturally, if the quick test shows any problem, you can do the more detailed test provided. Use the quick test for a check; the others are more useful for alignment, if you wish to do that yourself.

The spindle speed test checks and displays the spindle speed. The display shows an analog meter, with the desired speed (300 rpm) marked, and the actual speed displayed on the meter. In this, as in many other tests, you can make the adjustment while the test is under way, and the results will be displayed on the screen. The range displayed on the screen is from 285 to 314 rpm.

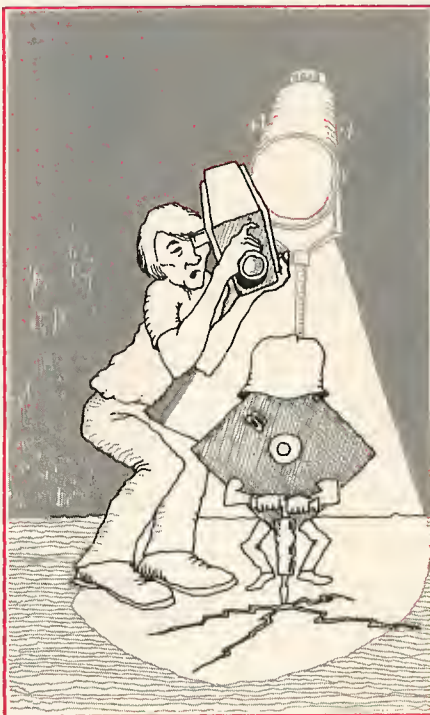
The index hole timing test measures the time from the passage of the index hole across the sensing photodetector to the sector ID mark recorded on the disk.

This time should be 200 microseconds, plus or minus 50 percent (so the range is 100 to 300 microseconds).

The analog meter displayed on the screen covers the range from zero to 580 microseconds, with a resolution of 20 microseconds. The desired range of times is indicated on the meter by dots from 100 to 300.

Again, this test operates in real time, and the adjustments can be made with very rapid feedback. I found that the index hole timing could easily be off more than the meter can show; on one drive I had difficulty getting the timing close enough to show on the screen so that I could adjust it.

The alignment sensitivity test determines the capability of the head to read tracks which are not precisely under it, and provides a histogram display of good reads versus displacement from the proper location of the head.



UTILITIES & HARDWARE

The measured range of displacement away from the proper location is 13 thousandths of an inch (mils) to either side; that is, 26 mils total range. The drive will be more tolerant of misalignment if it is more sensitive, but this test provides other information as well.

For example, if the head is dirty, or if the pressure pad is worn, the read sensitivity will be poor. If the histogram bars are grouped to one side or the other of the center line, the head is off in the direction of the bars.

The location of the center of the bar cluster roughly indicates how far the head is out of alignment. This test is upgraded about every five seconds, and gross misalignment may be corrected here before going to the next test.

The head alignment test precisely measures the alignment of the head with reference to the precision recorded tracks on the Dyan disk. This test displays an analog meter spanning -7 mils to +7 mils away from the proper location. The meter is calibrated in steps of 0.5 mil; hence it is a very precise tool for aligning the head. Note

Rod McCormick



that this test measures only the precise head location; the previous test measures the read sensitivity of the drive.

The directional seek test measures and displays the precision with which the drive mechanism can locate a specific track, approaching first from one direction, then the other (this is called hysteresis). Obviously, if the head can only find a track when it is coming in, then it will not be able to find the

track half the time. In addition, the drive will write tracks in different places, depending upon the direction of approach.

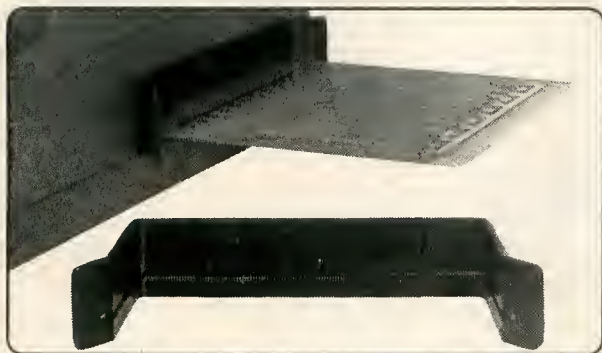
If a drive shows serious hysteresis problems, it is probably due for refurbishment. There are usually no adjustments for hysteresis in a drive carriage mechanism.

The head rotation test measures and displays the angle at which the head intercepts the track center line. Ideally, the head should be tangent to the track. This test uses a track which has its information recorded in a skewed fashion on the disk; hence, if the head is turned, it will more easily read the part of the track which is rotated the same way.

Some drives provide an adjustment for this parameter, but it is extremely sensitive. In fact, the maximum angular displacement tested by this program is 42 minutes of arc in either direction of rotation. This is likely to be too difficult an adjustment to make, even if your drive does provide the adjustment capability.

The analog alignment aid is not a test like the others. This menu lets you

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select the drive, head, or track; step the head in or out one track at a time; restore the head to track zero; seek any selected track; and start or stop the drive motor.

These options prove useful, for example, in adjusting the track zero microswitch for proper operation.

The final menu selection is the parameter change menu. This menu allows you to change the number of drives in the system and the drive step rate, and choose either the primary or alternate set of test tracks.

For example, there are two sets of tracks on the Dysan disk for testing head alignment and read sensitivity. One set includes a track recorded on track 39. Early Radio Shack drives will not read track 39, so the inner track test will always fail on these drives.

However, by selecting the alternate set, the Radio Shack drives may be tested on the inner track, since the alternate alignment track is on track 30.

Changing the drive step rate permits you to determine whether your drives are capable of a faster step rate; the options available are 6, 12, 20, and

30 milliseconds. A number of programs are currently available to alter this step rate to provide faster data access. It is okay to use a faster step rate if your drive passes the quick test at that rate.

The status line at the bottom of each test screen gives current information on the drive selected, the head selected, the track currently being used, the sector being read, and the actual reading of the floppy disk controller (FDC) status register.

The manual provides an excellent explanation of the meaning of each bit in the status register. With that information, you can interpret the status bits to figure out exactly what kind of error took place.

The manual is clear, well-written, and easy to follow. It provides completely adequate information for the use of the program. I felt that simply reading the manual gave me information I never had before on the function and design of disk drives.

The DDA program itself can easily be backed up to another disk, and even to cassette, which I recommend. It is certainly possible to have your disk

drives so far out of alignment that you cannot read in the program from disk and thus can't use it when you most need it. I found it easy to back up to cassette tape, using the addresses &H4000, &H6000, &H4000.

You cannot, however, back up the Dysan diagnostic disk because it is recorded by special machinery with carefully adjusted variations in its recordings. This disk can wear out, of course, although two sets of tracks are provided to allow for longer life. Replacement diagnostic disks are available from J&M at \$40 for either the single- or the double-sided variety.

This program might seem expensive, but I recommend it most highly. The going rate for disk drive alignment here in Albuquerque is about \$30 - 35, and I aligned three drives myself in about four hours — the program has already paid for itself.

Even if you never align a drive, you can use it to be sure that your saves are good and that your disks will be usable later. If you value your data and your programs, protect them with this program!

— Jeremy Stein

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64K Screen Expander II

Computerware
P.O. Box 668
Encinitas, CA 92024
\$24.95 tape
\$27.95 disk

One of the Color Computer's drawbacks is its severely limited display (32 x 16). Also annoying is its lack of lower-case.

Many software products available for the Color Computer have found a way around the limitations by using high-resolution graphics to generate a character set. Unfortunately, that method can cost substantial chunks of memory.

Now, however, if you have a 64K Color Computer, you can generate graphics with the "unused" 32K bank, and run your Basic programs in the lower 32K. All you need is the 64K Screen Expander II from Computerware.

This program produces a 51- or 64-character line *without* using any of the memory needed by your Basic programs. In addition, it features some other utilities sure to enhance the quality of your display, and make programming in Basic much easier.

The package does much more than just give you an alternate screen. Normally you'd have a hard time using the PRINT@ command with a screen size larger than 32 x 16. The Screen Expander modifies PRINT@ to accept the appropriate number of print positions for the screen size you are currently using. It also provides an alternate "x,y" method of positioning print on the screen.

Keyboard type-ahead is handy if you are a touch typist. Remember that graphics-generated screens do not display characters quite as rapidly as normal screens, though. Normally, with graphics-generated screens, it is easy to get ahead of the display and lose characters. Screen Expander allows you to type as fast as you want while the computer remembers what you have typed. At one point, I was 15 - 20 characters ahead of the screen, and my input was displayed accurately as soon as the screen caught up with my typing. This feature lets you look at your copy, rather than the screen, as you type.

An additional feature which is useful for input is the auto-repeat function.

When any key is held down, it will repeat. This is especially handy for long lines of the same character. You need only press the key and hold it down to type an entire line.

The Screen Expander will, if you wish, automatically number your Basic programs. You can just set the increment and beginning line number and start typing. Each line will be properly and automatically numbered for you.

A major shortcoming of Radio Shack's Disk Basic is the lack of error exits. Screen Expander also takes care of that problem with an On Error command. A simple PEEK will reveal the error code and then you can continue the error routine based on the type of error. This is an excellent enhancement to your Basic programs.

One of the advantages of a graphics-generated display is the ease with which you can customize your character set. Screen Expander includes a Basic program that helps you design your own characters. You can save any number of alternate character sets and use any one you wish. To try it out, I created a Spanish set, with accented vowels, upside-down question marks and the like. I found the character editor easy to use - it took no time at all to get the hang of it.

If you wish to return to the normal 32 by 16 display, a POKE will turn the Screen Expander off. It can be toggled back on with the same POKE, but I ran into a few snags. Sometimes, I would get a dark (inverse video) background after the POKE, and one time the screen hung up. These problems were due, I believe, to the programs I ran while in the normal screen mode. When I only ran Basic in normal mode and switched back to high resolution, there was no problem.

If you run an assembly-language program and find that toggling back to high-resolution causes strange results, you may have overlaid part of the

Screen Expander program. Turn your computer off and on and reload the Screen Expander.

The Reset key has no effect on your display under Screen Expander. This feature allows you to reset without losing your screen.

Since the text display is graphics-generated, it is fairly easy to mix graphics and text. The Screen Expander lets you copy a text screen to a graphics page, or a graphics page to a high-resolution text screen. The effect is almost infinite mix-and-match graphics and text capability.

The 51-character line is very legible on any TV or monitor. The optional 64-character line is barely legible on a TV, but excellent on a high-resolution monitor. You can switch between these two displays with a handy POKE. Also, you can use either a regular (dark letters on light background) display or an inverted (light characters on dark background) display.

Screen Expander II has a few drawbacks. When using CLSX in a program, the color parameter will not do anything. CLS clears the screen to whichever mode (normal or inverted) you are already in. It does no good to add a color.

If your Basic program includes any graphics, you should either program in the patches for use with the Screen Expander or turn off the expander to run your program.

On the other side of the coin, the advantages of this program far outweigh any potential drawbacks. The upper/lowercase display works well and gives your computer a much more professional display than the default screen provides. Because the program resides in high memory, *all* of the lower 32K is available for Basic (a PRINT MEM revealed 27,431 bytes usable on my Color Computer after a PCLEAR1).

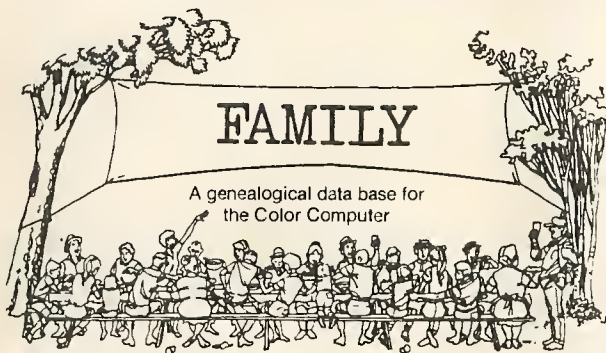
Screen Expander comes with a six-page booklet of documentation. Although it is brief and there are a few gaps, most of the information you need to use Screen Expander's power is there.

Screen Expander provides significant enhancements for the Basic programmer. It gives your Color Computer a much more professional display with a television and it looks even better with a high-resolution monitor. If you have 64K and program in Basic, buy this product.

— Norman Garrett

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If you are a programmer interested in setting up a financial program, you may find Number-Kruncher helpful.

Number-Kruncher is a Basic program which turns the computer into a calculator. It is meant to be used as a subroutine. Information is entered, calculated, and passed on to the main program through a number of variables.

The functions produced by the program are what you'd expect from a calculator: add, subtract, multiply, divide, decimal point, unary negative, enter, store in memory, recall from memory, CLEAR, and QUIT.

The program will accept many different inputs for each function. For example, for the add function the program will accept a plus sign (+), an unshifted plus sign (;), a "P" for plus, and an "A" for add.

For the benefit of the end-user there is a Help feature built-in. If you push H for help, a number of screens show all the possible entries which will be accepted.

The display produced by the Number-Kruncher covers approximately one-fourth of the normal screen. You can move this display anywhere on the screen.

When you first run the program, it explains itself. There are also three pages of documentation that are more than sufficient.

If you have a good understanding of Basic, you should be able to incorporate this program into your own with no problems.

I don't know what the program authors will want for royalties if a successful commercial program is developed using Number-Kruncher. Talk to them to find out.

This program does exactly what it says it will do — no more and no less. It is written professionally. If you need a calculator subroutine, consider this program.

— Bob Jack

Varalyzer 1.0

Prickly-Pear Software
8532 E. 24th Street
Tucson, AZ 85710
\$24.95, tape

Quick! Can you tell just what variables you've used in your latest Basic program and how often they are called? Varalyzer, from Prickly-Pear Software, can give you the answer.

Varalyzer, a machine-language program, comes on tape or disk and requires 64K. It copies the ROM to RAM and then relocates itself in the upper 32K of RAM. There it is out of the way of your Basic programs, and it won't interfere with the Basic interpreter. In addition, Varalyzer leaves a full 32K for your programs.

Varalyzer keeps track of all the variables a program uses and how many times each variable is accessed. With this information in hand, you can streamline your Basic code.

Included with Varalyzer are four pages of documentation. The first two explain how to run the program and use its features. The others are devoted to explaining good Basic programming methods.

Varalyzer's Features

Varalyzer can send variable lists to the screen or your printer. Operation is simple — just type EXEC to toggle it on and EXEC again to toggle off. USR is available for special control.

You can control Varalyzer from within a Basic program. Or, you can insert the sorted variable list it produces into your Basic program. You can even use Varalyzer to analyze only certain sections of your Basic program.

How can you use the list of variables that Varalyzer produces? First, it's an easy method of documentation. Next year when you decide to add a few bells and whistles to your snazzy Widget Analysis and Garage Door Opener Program, all the variables will be at your fingertips.

As you know, the Basic interpreter stores variables in the order it first encounters them. Each time a variable is referenced the interpreter searches the list from the beginning. If the variable is not found, the interpreter adds it to the end of the list. It makes sense to keep most-used variables at the beginning of the list, since the interpreter will spend less time looking for them. Here is where Varalyzer comes in. It tells you what the most-accessed variables are. You just put them in the beginning of your program, so they appear at the top of the list. That's it — simple and effective.

You can also specify sections of the running program you want tracked. Suppose you already know that one section of the program is where all the heavy processing occurs. You can go into that section and add a few commands to activate Varalyzer. The commands that you can give Varalyzer from your running program are:

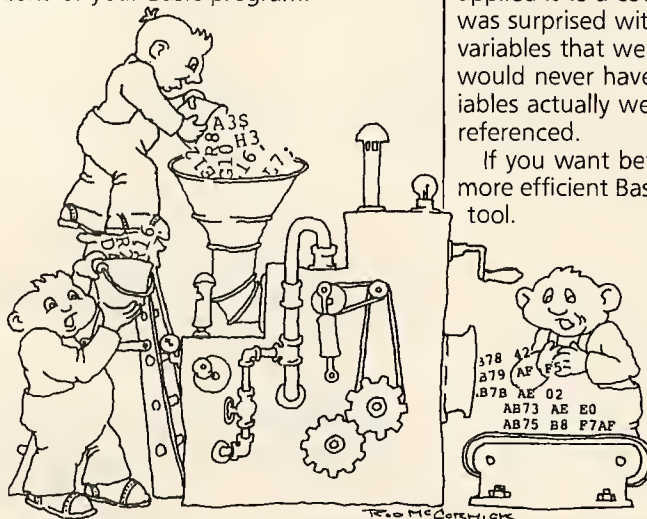
- B — Begin analysis
- E — End analysis
- C — Clear test buffer
- D — Display results on screen
- P — Print results
- T — Terminate program

If you choose not to incorporate any of them in your program, then the entire program is tracked.

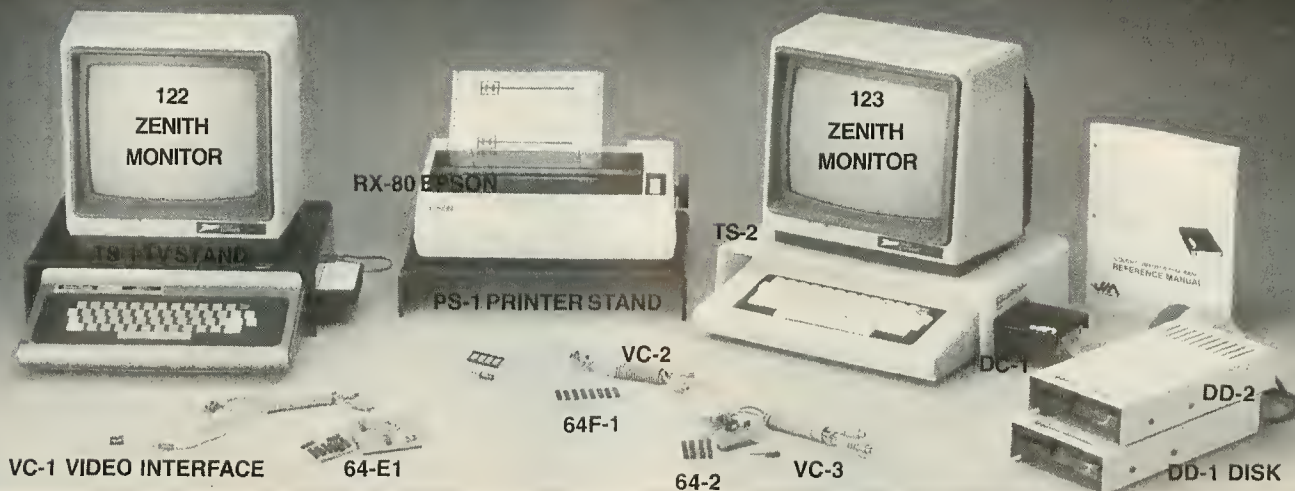
Varalyzer works and works well. I applied it to a couple of programs and was surprised with the results. I found variables that were not needed, and would never have guessed which variables actually were most frequently referenced.

If you want better-documented, more efficient Basic programs, buy this tool.

— Frank J. Esser



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Mul-T-Screen

Incentive Software
Box 323, Station B
London, Ontario
Canada N6A 4W1
(519)681-0133
P.O. Box 7281
Port Huron, MI 48301
U.S.A.

16K
\$24.95 cassette
\$27.95 disk

Let's face it, the Color Computer is a fine machine, but it has a display that even a mother couldn't love. Mul-T-Screen is a screen-expansion utility that provides a lowercase display without using hardware, defines text windows anywhere on the screen, and will single-step Basic programs, dump graphics to a dot-matrix printer, and let you make a printed copy of everything that appears on the screen.

"Mul-T-Screen prints any size in any mode using any color," its flier says, and it's true. The lowercase display ranges from four lines of eight characters each to 24 lines of 42 characters. The six display sizes are transparent to the user.

Mul-T-Screen uses the CHR\$(5) command to patch Basic so a graphics screen becomes the text screen. Changing text modes is as easy as: PRINT CHR\$(5); this creates the 42 by 24 display set. The six text modes can be used to create displays of eight characters by four lines to 42 characters by 24 lines. One mode creates a 32-character by 32-line display *sideways*, useful for labelling graphs. You could turn your monitor on its side and put Mul-T-Screen into this mode to create a 32-character by 32-line display, useful for writing a word processor, when you want to see more text at once than usual.

In any mode you can define up to four limited windows. These are actually *pseudo-windows* (on more expensive micros certain programs create box-like windows in which different programs can run). Mul-T-Screen's windows visually simulate true windows, but only to show separate text modes. Each window can have its own character size, foreground and background color, and cursor position. Defining windows and moving from one to another is easy.

You could use the pseudo-windows in another way: A program written to be used with Mul-T-Screen could

put a title at the top of the screen, using various colors for lettering and background. You could protect this title by putting it in a window. This will force any subsequent text to scroll under the title, keeping the title always on the screen; all statements, including the clear screen command and the Clear key, affect only the *current* window.

Mul-T-Screen lets windows overlap, but any text in the first will be over-written by text in the second. With real window software if you move from one window to another the one you are currently in will always be located on top; the computer automatically shuffles windows around for you.

The program's Basic single-stepper stops the computer at each program line and waits for you to press the space bar to continue. This lets you watch your graphics program develop step by step, see what is really going on during a bubble sort, or make sure your window-shuffling routines are working properly.

Mul-T-Screen will also dump the screen to any dot-matrix printer that supports bit-mapped graphics (like Radio Shack's DMP-200 and -400, or the Gorilla Banana). A second version of Mul-T-Screen has a screen dump for the Epson, Gemini and similar printers. Mul-T-Screen allows positive and negative (reversed colors) screen dumps in two sizes, full and mini. The full dump is a maximum eight inches wide. The mini is a maximum 3½ x 2½ inches. It isn't the fastest screen dump in the world: a mini can take up to two minutes on a DMP-200. However — once it has started the screen dump can be interrupted using the Break key.

This screen dump CHR\$(31);CHR\$(1); causes everything printed to the screen to be duplicated to the printer. This is a real-time mode. A CLS statement prints a blank line instead of forcing a new page (to save paper), although a new page may be forced with CHR\$(12).

The instruction manual fully describes how to use every feature, and on the back cover is a summary of control codes and what they do. This is very nice, since there are 32 of them. The manual was printed using a dot-matrix printer but has a professional look. Errors in the manual are updated in a program called Info, included with the Mul-T-Screen package. Also in-

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Color Computer/87

cluded are three demonstration programs that put Mul-T-Screen through its paces.

At \$24.95, Mul-T-Screen could be one of the great bargains of the year. It does what it is supposed to, does it well, does it *cheaply*, and is graced by a good manual.

— Gary Teter

LLister

Elite Software
Box 11224
Pittsburg, PA 15238
(412)795-8492

\$14.95 cassette

\$17.95 disk

This is a machine-language printer utility that adds a few characteristics to the Basic LLIST command to produce a pretty-print formatted listing.

LLister generates a hard copy listing of 60 75-character lines per page, issues a TOF (top of form printer control code) to skip over the paper perforations, and indents any continuing lines by five spaces.

Woefully lacking are multiple-statement line breaks, a left-hand margin for 3-hole punching, and page-numbered headers.

Using this programmer's aid is quite simple. Protect high memory, (C)LOADM "LLISTER", load the Basic program you wish to list with the appropriate command, EXEC and use the LLIST command as you normally would.

Once LLister is loaded into the computer you can forget about it until it's needed. Both the utility and the Basic program undergoing the formatted listing reside simultaneously in memory.

Since LLister is only 175 bytes long and is loaded into the upper limits of RAM that have been protected with a Clear statement, almost all of user memory is available for the Basic program. This is one of the utility's more notable points. It works on programs in memory. There are no disk files to open and then worry about closing, and no time-consuming cassette file reads. Most of all, unlike other pretty-printers on the market or available in the public domain, an ASCII save of the program to be formatted is unnecessary.

The documentation was a bit too brief for adequate understanding. Too

many questions were left to trial and error. For example, no mention can be found whether Extended Basic is required for proper operation.

A quick pass through Tandy's ED-TASM+ Z-BUG reveals only machine calls to Color Basic routines so LLister should work with all versions of the Color Computer, including the TDP-100. A minimum of 16K is required. I was able to locate LLister in memory above Disk Basic on a 64K system running ROM in RAM. This trick leaves all of the Color Computer's memory available for the subject program. After all, 175 bytes could mean the difference between a tight squeeze and a comfortable fit.

Not mentioned either is the strange display on the monitor after execution. Anything from a single orange graphic block to a line of alphanumeric garbage sprinkled with a few non-ASCII characters would appear immediately after invoking LLister. Is this normal? This gobbledygook didn't affect the operation of the program, but its presence made me nervous.

The documentation does not place enough emphasis on the need to execute for each successive run of this program. LLister keeps count of each line printed per page. If the listing is interrupted via the Break key this line count is maintained. Restarting the dump with only the Basic LList command will result in a short first page. With LLister resident at all times it is easy to forget and seems redundant to execute before LListing — especially if you have several program listings to format.

LLister is easily transferred to disk. Kudos to Elite Software for keeping the price difference between media versions reasonable. It appears only

the cost of the disk is being passed on to the consumer.

LLister performs exactly as explained in the documentation and as presented in Elite's advertisements... but read very carefully and understand that what you see is exactly what you get.

Would I recommend this product to a friend? Probably not. While LLister does have some notable features, for a nickel under fifteen dollars I would have expected more.

— Steve Wegert

Repeat Key

Elite Software
Box 11224
Pittsburgh, PA 15238

\$14.95 tape

\$17.95 disk

One of the functions missing from the Color Computer is a repeat key. Some word processors and utilities have a repeat key function built-in, but Basic does not. There is a solution to this problem — it's called Repeat Key.

Repeat Key will repeat any key (except Enter or Break) you hold down for $\frac{3}{4}$ of a second, at a rate of 20 characters per second.

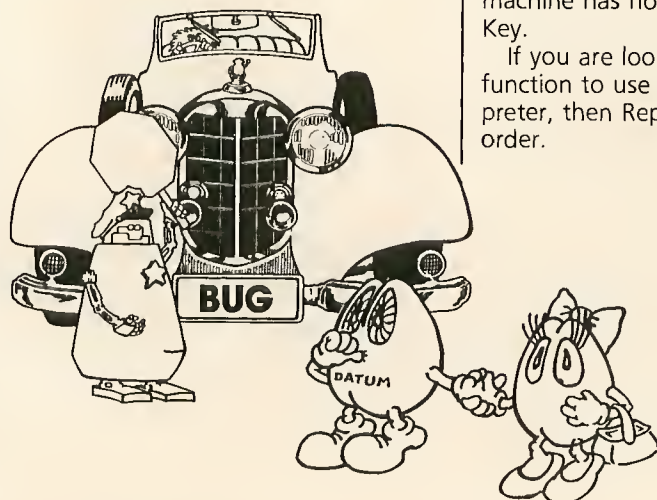
You can buy the program on either tape or disk. The documentation consists of a single sheet of instructions.

The program is written in position-independent code and thus can be loaded anywhere in memory. Instructions are included to move the program from memory to disk so it will load at the same position thereafter.

Repeat Key uses the upper 256 bytes of memory and requires that you perform a clear to keep it out of the way of the Basic interpreter. Resetting your machine has no effect on Repeat Key.

If you are looking for a repeat key function to use with the Basic interpreter, then Repeat Key is made to order.

— Frank J. Esser



64K Boot/Pager

Skyline Marketing
4510 W. Irving Park Road
Chicago, IL 60641
(312)286-0762

\$19.95, disk-compatible cassette 64K

One problem with the 64K Color Computer is its inability to address both its 32K memory banks simultaneously. The 64K Boot/Pager is two assembly language programs which let you use your 64K in various ways, and thereby derive maximum benefit from your added memory.

Essentially, the Pager enables your 64K Color Computer to access both 32K pages from Basic. Although only one page can be accessed at a time, you can switch back and forth between the two areas or even copy one page to another or swap the page contents. Practically speaking, these abilities can be useful if you are programming or testing programs written in Basic, among other possibilities. For example, you can load a Basic program, copy it into the other page, and modify the second copy. Then you can run the modified copy, run the unmodified copy, and compare the results. Your main limitation is the inability to use both pages simultaneously. That, however, is the computer's limitation, not reflective on this particular software package.

The Boot program copies Basic from ROM into RAM. This is useful if you wish to make your own modifications to Basic. When it is loaded and executed, an inverse OK prompt appears to let you know you are running from RAM Basic.

Although these programs are packaged together, they must be loaded and executed separately. I copied them to disk for easier loading, and had no trouble making the disk copy, since they are fully compatible with Radio Shack Disk Basic.

The documentation consists of one page of instructions which is adequate for using both programs. A complete source listing of the programs is also included in the package. If you are so inclined, the source listings would let you modify either or both programs.

Within the limitations imposed by the computer itself, these programs work as advertised. The Pager lets you manipulate the use of your 32K pages, and the Boot lets you easily access ROM

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Color Computer/89

Basic for modification. If you plan to perform your own upgrade to 64K, these programs are handy to have when you do the project. They would be useful for testing your upgrade after installation to make sure your 64K is completely accessible, and that you have performed the modification correctly.

This is a good pair of utilities for the price. They work well and allow limited use of the entire 64K with Basic. They do not, however, make it possible to use the second bank of 32K with a single Basic program. If your program needs more memory than you could supply in 32K this utility will not help much. Another disadvantage is that the switching cannot be performed by a Basic program; you must do it manually.

— Norman Garrett

Super Screen Machine

Sugar Software
2153 Leah Lane
Reynoldsburg, OH 43068
\$44.95 cassette
\$47.95 disk

The Super Screen Machine, from Sugar Software, is a machine code program which produces a 50-character by 24-line screen that is easy to read.

The Super Screen Machine requires approximately 5.3K bytes of memory, plus 6K bytes for the graphics pages (PCLEAR 4), and is loaded into the upper end of user memory. If you are running a 64K machine, then Super Screen Machine will copy the ROM to RAM and will remain active even if you press the Reset button.

The minimum memory requirements are 16K and Extended Basic. However, to use the character-generator program included, you will need at least 32K.

The Super Screen Machine can produce 32, 42, 50 or 64 characters per line. You can protect the upper half or the lower half of the screen from scrolling. Double-width printing can be invoked at any time as long as the graphics screen is set for PMODE 4 and larger, colored letters are available in PMODEs 1 and 3.

Other features are underlining, automatic subscript and superscript, alternate color set, variable scroll rate,

key-click volume control, Break-key enable/disable function, custom functions, and a method to interface with an EDTASM+ cartridge.

The following Basic commands are handled by the Super Screen Machine: CLS, PMODE, Screen, Color, Print Tab (), Print @, as well as comma fields, lowercase, graphics characters and all other keys, commands, PMODEs and Input/Output.

Included with the Super Screen Machine, for use on 32K or 64K systems, is a character-generator program. This program lets you design your own character set.

You can correspond with the Super Screen Machine by using the PRINT

"The Super Screen Machine can produce 32, 42, 50 or 64 characters per line."

CHR\$(27) command, giving you the ability to issue commands from your Basic programs or from the command mode. The manual includes a very good example of how to pass commands to Super Screen Machine from a running Basic program.

The Super Screen Machine supports upper- and lowercase characters, with true descenders for the lowercase. The method used to shift between upper- and lowercase is the same as that in Basic. The additional graphic characters (128 to 255) can be printed on the screen using the Basic command, PRINT CHR\$(). The following graphics commands are also fully interfaced: Circle, Draw, Line, Paint, PCLEAR, PCLS, PPOINT, PSET. In addition, four-color artifacting in highest resolution PMODE 4 is fully supported.

The Super Screen Machine supports a 224-ASCII character set, slashed zero, Greek math symbols, lunar lander, stick figures, tank, card suits, and electronic symbols.

A Demo program included with Super Screen Machine does an excellent job of demonstrating its functions. It is well worth your time to run this program before getting too involved with your own programs.

I think the Super Screen Machine is

a program of excellent quality. The program is well worth the price if you are looking for an enhanced screen with many formatting capabilities.

— Frank J. Esser

Colorzap

Software Options Inc.
P.O. Box 970
Bowling Green Station
New York, NY 10274
\$49.95, disk
16K

Colorzap is a Basic machine-language hybrid utility. You can use it to examine and modify data that is on your disks.

Colorzap lets you examine a disk in any drive (0, 1, 2, or 3). It can display data by sector, and modify that data.

Colorzap will also display sectors by file specification. I found this function very valuable to find all the commands I needed when playing adventure games.

Even when you take very good care of your disks they can malfunction. If you find a file that cannot be read you may be able to repair the damage if you know which sector is bad. The Verify Disk Sector option will go through your disk sector by sector. If it encounters a bad sector Colorzap stops and tells you. Then it is up to you to fix the glitch.

The Zero Disk Sector function is used when you want to change the values of data in any of the sectors. (This function is very dangerous since you can erase a program or destroy your directory.)

The Copy Disk Sectors function allows you to copy sectors.

The directory of your disk drive shows the number of granules for each program, but you need to know the track and sector numbers to examine a file. The Convert Granule Number function will convert a granule number to its corresponding track and sector.

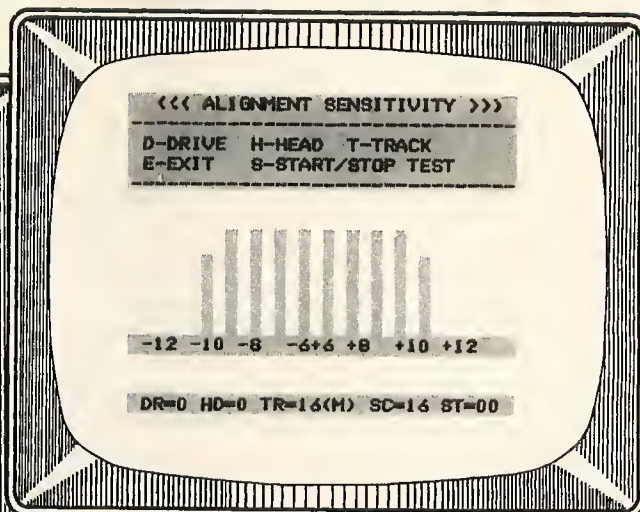
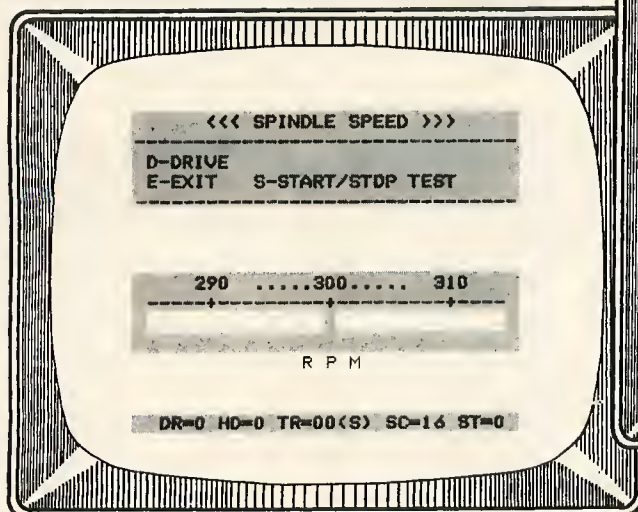
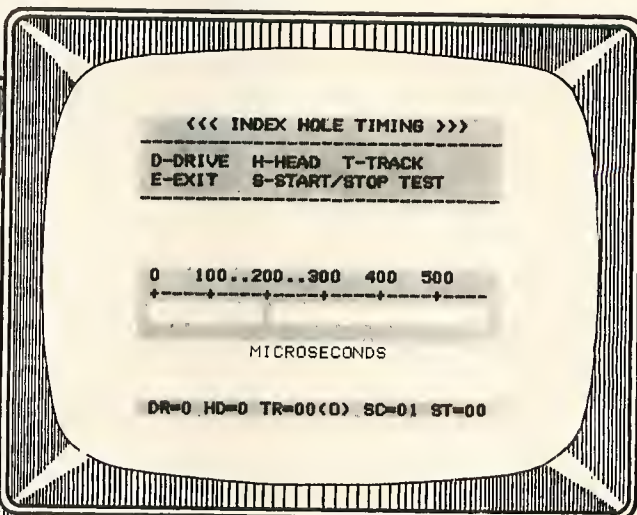
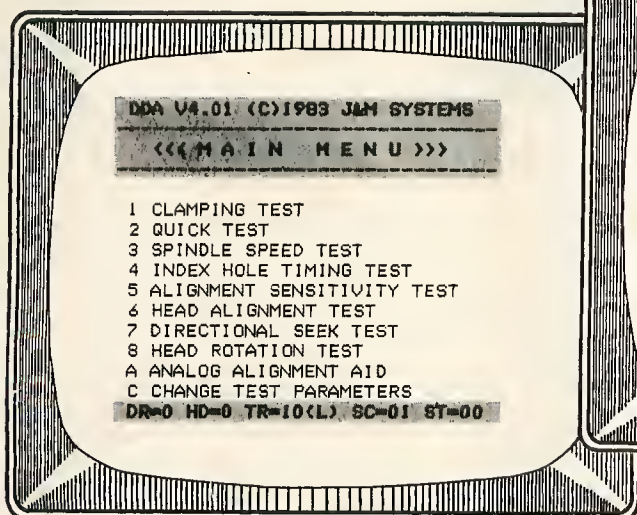
If you have been working on a program and mistakenly kill that file, try using Colorzap. A section in the manual is devoted to explaining how to recover a killed or clobbered file. I think just being able to recover killed files is worth the investment in this program.

You can also use Colorzap to learn how your data and programs are stored on disk.

— Harvey Kasner

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SEVEN EDITOR/ ASSEMBLERS

When you're flipping through magazines, do ads for editor/assemblers catch your eye? Do you know the features a good editor or assembler must have? Whether you're an assembly-language rookie or an old pro upgrading to disk, you'll find the following explanation helpful.

To begin, let's consider editors. These are some of the features that any good editor will have:

- It should include either a powerful line editing system or a good screen editor. For comparison a good line editor is provided with Extended Basic. Screen editors are nice but not necessary. A good screen editor should support such functions as block move, block delete, and global search and change.
- It will be fully compatible with Basic's I/O routines, disk or cassette or both.
- It should be easy to write and edit lines of text, with comments allowed.
- It should support standard printers.
- It should be capable of saving text files in standard ASCII format to allow compatibility with other editors.

Assemblers are harder to generalize, but here goes — these are features that any 6809 assembler should have:

- It should accept the entire 6809 instruction set in standard format as defined by Motorola.

A Note on Monitors

Although a monitor is not necessary for writing assembly-language programs, it is a very nice thing to have.

With a monitor you can see number to number with your computer and fine-tune or debug programs at the very basic machine level.

It lets you get a hex or ASCII dump of memory, or make a small change here and there just to see what will happen.

Some development packages come with monitors, others don't. I'll mention those packages that include monitors.

Reviewer Richard Derby made a concerted effort to get under his roof every editor/assembler available for the Color Computer. Those that are not covered in this review either were not made available by the companies that sell them or will be covered in future issues of The Color Computer Magazine.

- It should be fully compatible with Basic's I/O routines.
- It should accept standard pseudo-ops and directives.
- It should be compatible with most standard printers and include directions to make print formatting simple.
- It should provide adequate error messages that tell you exactly what has gone wrong during an assembly.

In both cases, the documentation should be thorough and easy to read. Programming aids and processor data sheets should be provided for reference — both beginners and pros find these useful and reassuring.

Manufacturers

CerComp
5566 Ricochet Avenue
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Spectral Associates
3420 S. 90th
Tacoma, WA 98409
(206)581-6938

CCEAD

Eigen Systems
\$6.95

CCEAD, the Color Computer Editor Assembler Debugger, is written in Extended Basic, and comes on cassette in two versions. One has in-program comments and the other doesn't.

The Editor

CCEAD is menu-driven with five options: editor, assembler, debugger, read file, and save file.

Its cursor moves up one line, right one space, or left one space when you use the up arrow, right arrow, and left arrow, respectively. The Enter key moves the cursor down to the next line. Lines may be deleted one at a time and scrolled 12 at a time, up or down. Files are saved or loaded from prompts which are actually the Basic Print# and Input# commands.

The Assembler

To do its thing, the assembler portion needs about five seconds per instruction, which means a file with a hundred instructions takes about eight minutes to assemble.

Lines may be, at most, 32 characters long. Symbols must begin in column 1 and are limited to six characters. Comments must begin with an asterisk.

All indexed modes, as well as non-indexed indirect mode, must be prefixed by a comma for proper interpretation.

The D register may not be pushed or pulled but must be treated as its individual A and B registers.

No arithmetic calculations of any kind are allowed during assembly, which means you can't even specify an offset from a label.

The assembler supports five standard directives: ORG, RMB, FCB, FDB, and EQU.

Output may go to the screen or to a printer.

There are six error messages which are reported with number codes.

The debugger is a tiny monitor that displays one address at a time. Its features are memory exchange and jump to subroutine.

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CCEAD's documentation is fair and contains enough program information to let you customize it to your particular needs. If you're interested in seeing a good programming job in Basic or just can't afford more than \$6.95, buy CCEAD. If you want a more deluxe editor/assembler, shop around.

Ultra 80C

Spectral Associates
\$52.95

Ultra 80C is a disk editor/assembler for 32K systems. Both the editor and assembler are copyrighted by Technical Systems Consultants and are designed to run on the Flex operating system. Spectral Associates has adapted the package to run on the Color Computer's disk operating system.

The Editor

The editor is line-oriented. Commands are one, two, or three letters and most of them will let parameters be specified in one of three ways: by a line number, by an offset to indicate another line number, or by a string. Beginning parameters are given first, followed by the command, followed by the end line parameter.

The editor uses the current line principle — operations are performed on the most recently referenced line unless a new line is specified. New lines are specified three different ways: directly, as the desired line number; relatively, as an offset from the current line number; or by contents, as a string. Also, the top and bottom of the file may be stated directly.

The Set, Tab, Expand, Gap and Bell commands do not work as documented. The Header command does work but has little meaning since Tab doesn't work.

The end of command character is a colon, so more than one command may be specified on a single line. Line number display can be switched on or off. The Find command searches for the first occurrence of your specific string starting in a specific column. The Append command is used with lines, not files, in this editor; with it characters may be added to the end of a specified block of lines, which saves a whole lot of typing.

There are two forms of the Change command. One changes all occurrences of the target string within the indicated range of text. The other changes only those occurrences verified by you.

Copy, Delete, and Move are the standard oriented commands. The Overlay command allows changes to be made in an existing line of text, but I found no easy way to delete single characters or larger portions of a line with any of the commands.

Lines may be replaced or inserted anywhere in the file and any range of the text may be displayed on screen.

Files or portions of files can be written to tape or disk using Save and Write. Files can also be read using the Read command.

When first entering the editor, you are prompted for a file name. If the file name already exists it's loaded and the original file name extension is changed to BAK to indicate a back-up file. This is a convenient use of a wise naming scheme. The new file name is the same as the old unless otherwise indicated. If no file exists by the given name then a new one is created.

Log or Stop commands will exit the editor and write the current file to disk with the current file name.

If a file is being edited but not all of it will fit in the buffer, then the New command can load in another portion of it. The portion of text currently in the buffer will automatically be saved to disk. The Flush command works similarly, but no more of the text file will be loaded into memory.

The Assembler

The assembler portion of this package is powerful. Upon entry you are prompted for the date and the name of the text file to be assembled. A binary file name may be specified after the source file name along with any assembly time options and command line parameters.

Command line parameters work as macro definitions do, except the strings are inserted directly into the normal lines of text. Assembly time options for the most part countermand default options like sorting the symbol table, object code output, and listing output.

The assembler will accept all 6809, and most 6800 and 6801 instructions, plus a few convenience mnemonics.

Standard pseudo-ops like ORG, RMB, and FCC are accepted. Multiple origins are supported.

This assembler supports both Macros and library files; each may be nested to a level of nine. Local labels are not allowed but you may pass parameters to change the label for each definition of the macro. Conditional assembly is also made available. Another program on the disk, Join, joins any two binary files into a third file.

The documentation was intended for several versions of the original editor/assembler, so much of it is irrelevant, some of it is even misleading and inaccurate.

Addendums listing changes are neither fully accurate nor clear. Users will need quite a while to sift out the applicable portions. This product is somewhat overpriced.

Cores 64 with Debug

CerComp
Cores 64 with Debug (Disk)

There are two editor/assembler programs available from CerComp. They are: Cores-64 w/Debug and a Disk Editor/Assembler and Debug.

Cores-64 with Debug sells for \$34.95; its disk version costs \$49.95.

Cores-64 w/Debug is an enhanced version of Cores9 (a product that's no longer on the market) and is designed to accommodate systems with up to 64K of RAM. When first running it you tell it your memory size; the program configures to your system accordingly.

Both Cores-64 and the disk version run automatically upon loading, and because of the autostart feature, back-up copies cannot be made. Cores9 must be entered with EXEC.

In the disk version a back-up copy is allowed but it won't run, so you must use the original. In the event the original gets wiped out, the back-up is intended to be copied back onto the original. This isn't a tantalizing feature.

The Editor

The editor is line-oriented with all commands abbreviated to two letters. Cursor control is with the arrow keys in combination with the Shift key.



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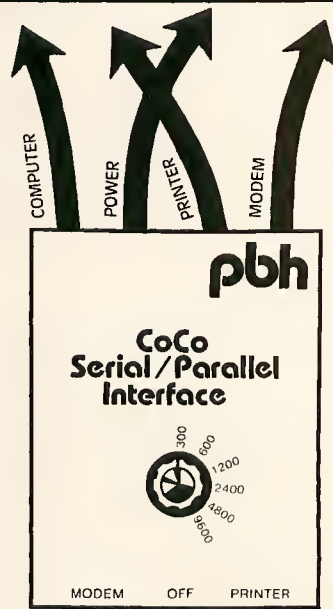
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Turtle Micro Ware
East Lime, CT. 06333

The file may be renumbered, but the increment between line numbers may be only one digit. Automatic line numbering is also limited to one-digit increments.

In the disk version, if you try to load a file without line numbers the editor automatically provides them. This is a very handy feature for when you must load text from an editor that doesn't use line numbers. You also have the option of saving text files with or without line numbers.

All or a portion of the file may be deleted, moved or copied. String search and replace is supported.

Line length is normally 128 characters but may be changed from 1 - 255. CerComp went a bit too far, I believe, with audio warnings here. Tones are heard 10 positions before the end of line, at the end of line, and on each character entered after the end of line.

Cassette tape file commands for all versions are TLoad (TL), TSave (TS), TAppend (TA), and Skip (SK). They work

the same as the equivalent Basic commands.

Size (SI), prints out the remaining text buffer space in decimal. The amount of memory currently being used is also returned.

If a printed out copy is specified, the editor checks for printer hook-up. If nothing is attached it tells you. This is good news for users without printers as it prevents the computer from hanging up.

Printer baud may be changed to any of five values for easier interfacing.

The Run command allows previously assembled programs to be run and tested.

Additional commands in the disk version are: Save, Load, Append, Roll, Get, Dir, and Kill. Roll lets you write a portion of the text file to disk. Get allows a portion of the input file to be read. Append works the same as the tape file version. The other disk commands do the same things you'd expect them to do in Basic.

The Assembler

The assembler works well enough. Most standard directives and pseudo-ops are supported, but the SETDP directive is conspicuously missing.

FCC, FCB, and FDB statements allow multiple expressions separated by commas.

Options are specified in the text file by the use of the OPT directive. Using one-letter specifiers you may command the assembler to send object code to memory, tape or disk. Assembly listings may be listed or printed, as well as the symbol table. All of the options may be switched off as easily as on by prefixing specifiers with NO.

You have to get the hang of using this assembler. On entry it asks for input and you must specify a pass number and a code letter to determine how you want the assembly done and where you want it sent. Only certain combinations are allowed and they can be used only one at a time.

The assembler accepts all standard 6809 and 6800 mnemonics except LSL (Logical Shift Left). It also lets you force addressing modes with the < and > symbols.

The Cores-64 and disk monitors both allow memory examination and exchange but display only one byte at a time. Both allow 10 breakpoints to be set or reset.

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Registers may be displayed and reset. The Go command allows the execution of subroutines. Memory is displayed on screen in both hex and ASCII. A block of memory may be filled with a specified byte. A Find command locates a sequence of memory bytes, sort of like a string search.

There is also a disassembler built into the monitor, a nice thought but in reality a disappointment. The listing appears as hex digits — who can read them?

Both versions of the disassembler are very syntax-dependent which makes them rather difficult to use. There are numerous bugs inside, too, some of which make the system crash.

The documentation is poor. Overall, another couple of months of development would have produced far superior products.

The Assembler

Inconveniently, the FCB and FDB pseudo-ops can't handle more than one expression each. With large amounts of numerical data to put in your source file, you will find yourself spending a lot of time typing, and using large amounts of memory. In addition to the FCB and FDB pseudo-ops, the assembler accepts END, EQU, FCC, ORG, RMB, SET and SETDP. ORG may be used more than once in the same program,

a capability usually found only in disk assemblers.

Assembler options are enabled by use of two-letter codes called "switches." They are separated by the slash character and specified at assembly time. Options include: wait on error, short screen listing, no object code in listing, no symbol table in list-

EDTASM+

Radio Shack
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Since EDTASM+ is in a ROMpak and nonvolatile it offers access to all of the available RAM in your system.

Of course, it supports cassette I/O only since it occupies the expansion port.

The Editor

The line-oriented editor saves text to tape with line numbers. That makes it incompatible with many other good editors, but it's easy to use.

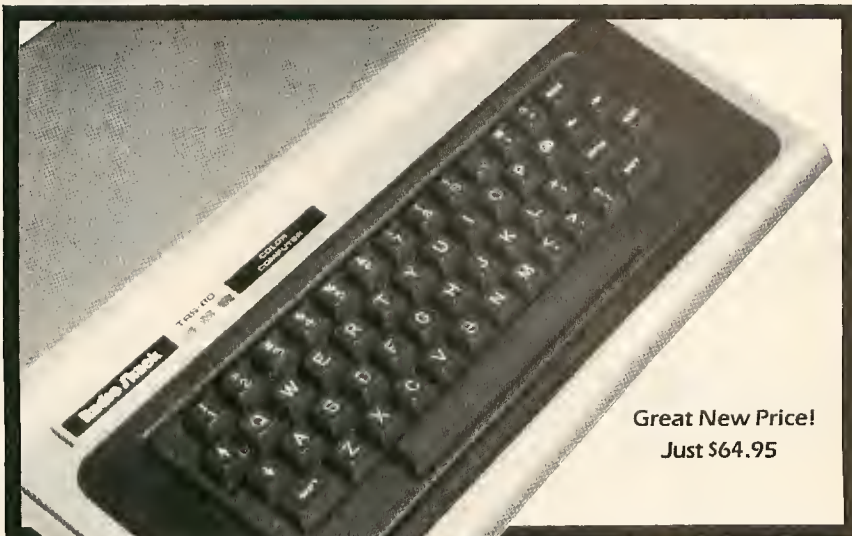
Its line editing features are even more powerful than Extended Basic's. You can also delete a range of lines and copy or move a range of lines with single commands. The F command will find any strings of characters in any part of the file.

One great feature is the tabbing. The right arrow is used as a tab character to separate fields without wasting memory or worry about formatting the output into columns.

Lines are renumbered in a similar fashion to Basic's renumber function. Any range of lines may be printed on the screen or sent to a printer with or without line numbers.

Q returns you to Basic but also destroys the text file. You may reenter the editor at any time by EXEC 49152 but any program in Basic will be destroyed.

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ing, no listing at all, listing on the printer, absolute origin, in memory assembly, and manual origin.

The Zbug debugger is an excellent monitor, with a variety of display modes to choose from: symbolic, numeric, and mnemonic. Zbug allows calculations, including logical operators. From Zbug you can get a disassembled listing to your printer or screen, or save any memory contents on tape. If you want to use some of the Basic ROM routines in your programs that capability is nice. Documentation is good but lacking detail in some sections.

This is one of the better editor/assemblers you can buy. It's the first one I bought, and I still use it from time to time, even though I have a disk system.

Ed. note: A number of patch extensions are available that enable disk I/O with EDTASM+.

Disk EDTASM+ is reviewed on page 102.

SDS80C

Macro-80C

The Micro Works

The Micro Works has available two versions of its editor/assembler/monitor package; the original SDS80C and the beefy, son of SDS80C, Macro-80C.

SDS80C is a ROMpak and sells for \$89.95, while Macro-80C is a disk version and a good buy at \$99.95. The major difference between the two is that Macro-80C contains a full-blown macro assembler, two utilities and sample text files to experiment with. Macro-80C allows over 200 characters per line; SDS80C allows 32.

The Editor

All commands are single letter and the editor is fully screen-oriented, making it very easy to use. The cursor is moved anywhere in the text file using the arrow keys in combination with the Shift key. Whichever portion of the file the cursor is in automatically appears on the screen.

All keys have an auto-repeat function, a real timesaver and easy on the fingers to boot.

In the line insert mode the right arrow is used to tab from field to field (in SDS80C the space bar does the tabbing).

The delete mode allows deletion of either 32 characters or one line at a time using the right arrow and down arrow keys respectively.

Altering text is easy in the exchange mode, where characters can be inserted or deleted using the cursor controls or simply written over with new ones.

There are two forms of string searching in the disk version. The first finds any string pattern and allows use of a wild card character to leave "holes" in the pattern.

The second finds labels and is a major method of moving about in the file. (SDS80C doesn't support the label search and uses -F to initiate a backwards search; Macro-80C uses B for backward search.)

You may jump entire pages with the P (forward) and O (backward) commands. (SDS80C uses -P for paging backwards.)

Specified strings can be found and replaced, using wild card characters if desired. The A command is used to repeat the change.

Any size block of text may be moved or copied using the cursor controls.

The Jump command, (J), places the cursor at either the beginning or end of the file.

In any mode using Macro-80C, the Clear key may be pressed to print help messages on the screen and is most useful while learning the editor because it saves having to look things up again and again in the manual. (This feature is not available in SDS80C.)

SDS80C has commands for saving and reading from cassette; with Macro-80C you enter a disk file name as you leave the editor.

The Assembler

Both versions support all 6809 and 6800 instructions, local labels, conditional assembly, and pause/speed control of the listing. Both also allow listings to the screen or printer, and sorted symbol tables.

In SDS80C object code can be generated to tape, memory or both. There is also a single step assembly mode.

Other assembly time options on the Macro-80C are cross reference tables, long branch warning, zero byte error (for Basic programs), error halt, and output delay.

There are actually two assembler versions of Macro-80C on the disk; one each for output to the screen and to the printer. All the regular options are included in the printer version, plus 80-column format, carriage return suppression, paging or no paging, and form feed characters.

Both SDS80C and Macro-80C support all standard pseudo-ops. Both also support conditional assembly with pseudo-ops like IFEQ, IFNE, IFGT, IFGE, and ELSE. Macro-80C, though, boasts many more pseudo-ops. A few are: INCL, to include source files; FCCS, to form constant character in screen code; APOP and APSH, to manipulate a user stack at assembly time; and MACR, which begins a macro definition.

Macros may have their own or local labels, and up to 36 parameters may be passed.

Entire libraries of routines may be included during assembly time with the INCL pseudo-op.

Macros and included files may be nested virtually any depth as long as there is room on the local stack.

The disk version also has a few "extra instructions" which use undocumented 6809 op codes. Some of these are: CLRD, TSTD, NEGd, and RESET. RESET is interesting because it allows a software processor reset.

In both versions expressions may be written to virtually any complexity. Multiple expressions of any length are allowed in both string and numerical data statements.

Except for a few slight differences, the two packages' monitors are virtually the same. In SDS80C the monitor can be entered directly from the editor. If the assembler is used, control goes to the monitor after assembly to allow debugging. SDS80C also has a built-in calculator which allows the evaluation of hex numbers. The Macro-80C monitor has two calculator commands, one for hex to decimal conversion, another for decimal to hex conversion.

You can jump to subroutines with J and to stand alone programs with G. Memory and registers can be examined and changed.

Blocks of memory can be transferred with the T command.

In the disk version the I command allows a range of addresses to be filled with a specified byte.

Once in a display mode, the up and down arrow keys can be used to scroll throughout memory.

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Macro-80C also contains two utilities: FILELIST and XFER. FILELIST lists any text file to the screen while in Basic. XFER transfers files from one device to another.

Macro-80C has many example text files to help you get familiar with it. Documentation for both versions is thorough, and easy to read.

Macro-80C has a lot to offer beginners and veteran assembly-language programmers. I recommend it to anyone with a disk system. SDS80C also has much to offer and all the memory space and crash-proof advantages of a ROMpak.

Color Editor Color Assembler Color Scribe

Computerware

Computerware's editor and assembler are each sold separately on tape and disk. Prices for tape editor or assembler are \$24.95 each; disk versions sell for \$49.95.

The Editor

The tape and disk versions of the editor are quite similar.

The editor is current-line oriented and has a powerful set of commands for creating and editing text files. The up and down arrow keys are used to move the current line up or down in increments of one. Using the Shift key with the up and down arrow keys, you can move to the top or bottom of the file.

Commands are mostly of the one- or two-letter variety. The format is a beginning parameter followed by the command followed by ending parameters.

What makes the editor so powerful is its ability to accept parameters three basic ways: by line number, relative offsets, and strings. This lets you move about in your file whether you know specific line numbers or not.

The editor obeys all standard commands and others that are not so standard. Add, for instance, allows characters to be added onto the end of a line or lines. Macro sets up a pre-determined command sequence which may be executed at any time using Shift-@. This is useful for rapid viewing of text screens. Repeat lets you repeat the last command by pressing the right arrow key.

Printed out copy is easy to get and formatted according to the fields set up by the Tab command. Files or portions of them can be written to tape at any time.

Color Scribe, the disk version of this editor, is even more powerful and has most of the capability of a full size quality word processor. In fact, it's sold as a word processor. Disk commands allow all or portions of text files to be printed. A DIR command gives you a printed listing of the directory.

The line editing features of Color Scribe are far superior to the tape version. Using the Clear key as a control key in combination with other keys, literally anything can be done with a line of text. You can insert and delete characters or words, append lines, break up lines, copy portions of lines, backspace characters or words, and redisplay lines, to mention a few. It's much more powerful than Extended Basic's line editor, which says a lot.

A Bell command fully controls an end of line signal.

The formatting portion of the editor gets text to the printer any way you want it. Two-letter commands are placed in the text during editing to allow page and line directives, centering and underlining, line length and indenting, headings and footings, and printer control codes. When you want a printed out copy of your work, you call on the formatter portion of the program, which prompts you for an output device and source of the text.

The Assembler

The assembler requires two passes of the source file, and in the tape version you must rewind after each pass.

At assembly time, options are displayed and you may choose any number of them. All options have a default value which may be changed by directives inside your file or overridden.

Some constants that can be changed to suit individual needs include audio control, top of memory, and printer parameters.

All 6809 and 6800 mnemonics are accepted.

The disk version of the assembler has even more features. It is a macro assembler, and a very versatile and useful one at that. Local labels are not supported but assembler-generated labels may be used to great advantage. RPT, a powerful pseudo-op, lets sections of code be repeated any number of times, saving much writing time and text file space.

Conditional assemblies are allowed using IF statements.

Library files may be included at assembly time using the LIBS command, and they may be nested to a depth of two. REG allows labels to be used during stacking operations.

Included in the disk version are two utilities: XREF and FIND. XREF creates a symbol table with line number references from a saved disk text file. Find prints out the beginning, ending and transfer addresses of any binary file.

The documentation is excellent. Both the tape and disk versions of Computerware's editor/assembler are good buys. Color Scribe is an exceptionally good buy since it is an editor and word processor in one.

Ed. note: Computerware also offers an Advanced Disk editor for \$29.95. This is the same editor as Color Scribe, but without the text-formatting commands.

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Color Computer/101

Product	Company	\$	Sys Req	Type	Use
MACRO-80C	The Microworks	99.95	16K, Drive 0	disk	easy
SDS80C	The Microworks	89.95	16K	cart	easy
COLOR EDITOR	Computerware	24.95	16K	cass	easy
COLOR ASSEMBLER	Computerware	24.95	16K	cass	easy
COLOR SCRIBE	Computerware	49.95	32K, Drive 0	disk	easy
6809 MACRO ASSEMBLER & XREF	Computerware	49.95	32K, Drive 0	disk	easy
EDTASM +	Radio Shack	49.95	16K	cart	easy
ULTRA 80C	Spectral Associates	52.95	32K, Drive 0	disk	fair
CCEAD	Eigen Systems	6.95	16K, Ext Basic	cass	fair
CORES9	Cercomp	29.95	16K	cass	hard
CORES-64 W/DEBUG	Cercomp	34.95	16K	cass	hard
CORES-64 W/DEBUG	Cercomp	49.95	16K, Drive 0	disk	hard

Comparisons

I preferred Radio Shack's ROMpak, EDTASM+ over The Micro Works SDS80C ROMpak mainly because of the fantastic monitor/calculator Zbug.

The best tape-based editor in my opinion is Computerware's.

The best tape-based assembler is a toss-up between Computerware and CerComp. I like the features that the Computerware assembler has to offer, but I don't like having to rewind the cassette tape two times to get an assembly. CerComp's assembler is harder to use, but its files are in memory, providing for quicker assemblies.

As for disk-based editors, Computerware's Color Scribe wins hands down. It has all of the features of a good editor and word processor rolled into one. I like the Macro-80C editor, too, simply because it is screen-oriented and so easy to use.

The Macro-80C Macro assembler by The Micro Works is without a doubt the most powerful disk-based assembler that money can buy for your Color Computer, although Computerware's Macro Assembler is a close second. ■

Disk EDTASM

Radio Shack
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Fort Worth, TX 76102
16K, 32K preferred
\$59.95 disk

I hope my feelings about the cassette-based EDTASM+ (written by Microsoft) coincide with those of the reviewer of that piece of software; I think it is a darn good assembler, albeit with some shortcomings. The disk-based EDTASM corrects those shortcomings and results in an excellent disk-based assembler.

Much of Disk EDTASM is really EDTASM+. Let's recap the EDTASM+ commands included in Disk EDTASM:

- Editor: the editor in EDTASM+ is basically a line editor — you specify a range of lines that can be inserted, deleted, replaced, renumbered, listed on the screen or printer, copied, moved, or written to/read from disk. You can also process an individual line (or range) of lines for editing on a character basis, with a set of sub-

commands very similar to the commands in Extended Color Basic (you know, the "violent" commands: Hack, Kill, and so forth).

- Assembler: the assembler in EDTASM+ is adequate, but not all that powerful as far as the assembly options. You can generate a listing on the screen or line printer, list a symbol table, or wait on assembler errors. The real beauty of the assembler is that you can do "in memory" assembly, meaning that the source code created by the editor (and still in memory when the assembler is active), can be instantly assembled from memory, producing object code in memory. Ordinarily, this would be of dubious value, but read on...

- Debug (actually ZBUG in EDTASM+): having assembled, you can now go to the debug portion of EDTASM+ using a single command. Voilà! (Or Bleep!, if you're a hacker and not a cunning linguist), you're in debug. In debug, you can do the things you'd expect to in a debug program — examine memory, breakpoint locations, move blocks, and so forth. In addition (and here's why I love ED-

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TASM+), the symbol table is available to ZBUG so you can reference locations symbolically by the names from the assembly listing! Not only that, but you can operate in a variety of modes to examine locations — symbolic disassembly mode (a disassembler included with the package!), ASCII mode, byte mode, and so forth.

If it sounds like I'm pro EDTASM+, I am. However, I wound up getting the MicroWorks Assembler simply because it operated with source and object files on disk. A disk version of EDTASM+ wasn't available at the time.

Enter Color Disk EDTASM. Before I saw the package I thought to myself, "I'll bet I know what they did at One Tandy — they took the basic EDTASM+ and added a few commands to save the source and object on disk and called it a new product!" Well, they did, but in addition to that look what they included:

- Macro Capability: the disk version has a macro capability, similar to the MicroWorks assembler. Macros are "in line" subroutines for source code — a way of generating source code automatically, tailored to different pa-

rameters, if the Macro Assembler is smart enough, and this one is.

- Conditional assembly pseudo ops let you conditionally assemble certain portions of code. These are not often used (they're typically used to generate different versions of the same program), but are nice to have.

- The ability to load source files from disk *and* tape. This is definitely preferable to disk alone, as it makes those files you used on cassette-based EDTASM+ usable.

- The ability to save and load blocks of memory to disk and tape. This is a handy feature for debugging.

- The ability to load a file from disk or tape with its appended symbol table. This means you can save a modified object code file during debugging and still maintain the symbol table for future debugging without reassembling.

- An include assembler pseudo-op to let you link source language files. This handy feature lets you assemble source files that won't fit into memory by breaking them up into separate modules.

- Some nice formatting features

for the assembler, including a Title and Page pseudo-op.

Documentation has also been improved over the EDTASM+ manual. The Disk EDTASM manual lists all commands clearly and is well-organized. In addition to the description of commands, there's a good section on ROM and DOS subroutines and a complete listing of the DOS portion of Disk EDTASM! Don't expect, however, to read the manual and get a tutorial on Color Computer assembly language. There are (ahem!) other books for that.

In short, the new disk-based version of EDTASM+ not only includes the well-thought-out features of the cassette-based package, but also fills in the gaps to make the disk-based version a powerful product. It's not that some other editor/assemblers, such as the MicroWorks products, aren't as good in the editing and assembler area — they are; but Radio Shack's Disk EDTASM combines everything with their super symbolic debugger in an integrated package. It's neat, and I'd recommend it, especially for the beginning- and intermediate-level user.

— William Barden, Jr.



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HARDWARE

Wordpak (Revision C)

PBJ Inc.
P.O. Box 813
N. Bergen, NJ 07047
\$139.95, Flex or OS-9
Patches \$19.95 each

PBJ has developed an 80-column display for the Color Computer. It's a hardware device called Wordpak, and it's astounding.

Wordpak is not a software-driven character generator — it's a video display generator. With it and a high-resolution monitor, you'll be able to type at your Color Computer for hours without eyestrain.

Wordpak's control codes let you sound tones, move the cursor, initiate x,y cursor positioning, clear the screen, home the cursor, switch between destructive and non-destructive cursor, erase from cursor to end of line or screen, reverse the character image and change the number of characters per line. Generally, you can perform these functions with Print CHR\$ commands in a Basic program, or in immediate mode.

Although you can change the number of characters displayed on a line, the character size does not change. Wordpak simply wraps the line at the designated point, and maps the screen accordingly. You can set the line length to any of these values: 80, 72, 64, 51, 42, 40, 36 or 32. You can run Color Computer Basic programs that use Print@ statements if you set the line length at 32.

Wordpak includes two built-in keyboard functions: automatic key repeat and clear/control. The auto repeat feature works for all keys except the Clear key. When a key is held down, it repeats after two or three seconds. Clear/control toggles the clear key between its normal clear function and that of a control key.

Wordpak is housed in a case similar to that which holds the Radio Shack disk controller. It plugs into the expansion port or an expansion bus. If you have a disk system, you can plug both Wordpak and the disk controller in via an expansion bus or Y-cable connector. Wordpak is totally compatible with a disk system.

Normal video output must be re-routed to go to your monitor (the monitor plugs into Wordpak via a standard cable with RCA-type jacks). To perform this rerouting, you just run a machine-language video driver (written and copyrighted by Cer-Comp) which allows you to set parameters and invoke the Wordpak display. Once the screen is invoked, your normal screen is disabled. Disconnect your normal cable and plug the Wordpak cable into your monitor. Then you will see a light (green, white or amber, depending on your monitor) display on a dark background. Wordpak is up and running. Once it is invoked, you cannot reverse the process without powering down and turning the power back on again.

Wordpak works with most Basic programs, but it doesn't support high-resolution graphics. Run your graphics programs in the normal screen mode, or on your television.

I found that switching cables between my monitor and TV was a nuisance, so I purchased a small switchbox that takes two RCA-type inputs and has one output. A switch selects the appropriate input to be routed to the monitor. That enables me to switch back and forth between using Wordpak and normal screen. Another alternative is to leave your television connected as normal, and connect your high-resolution monitor to Wordpak.

Documentation for Wordpak is adequate, but it could be improved. It is replete with grammatical and spelling errors, but has fairly good explanations on how Wordpak works. If you are an electronic hobbyist, you'll find a lot of information about the design and operation of Wordpak. Schematics of the board are also included.

Other DOSes

If you use OS-9 or Flex, the problems Wordpak has under Disk Basic are solved, except for the graphics problem. The OS-9 and Flex versions are easy to invoke and totally compatible with any non-graphics software you wish to run. An added advantage is the memory savings. In the OS-9 version, for example, 2.5K is saved over the standard operating system and approximately 12.5K is saved over using a software screen display generator, such as O-Pak.

To use Wordpak with OS-9 or Flex, you must purchase the FHL Flex driver

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UTILITIES & HARDWARE

or the Color Computer OS-9 driver. Following step-by-step instructions, you can create a new boot disk that will automatically boot OS-9 or Flex with Wordpak.

Since I am a heavy user of OS-9, the memory savings was attractive to me. I boot OS-9 with my Wordpak driver and have now designed most of my software to run using 80 columns. Additionally, there is a wealth of software available for Flex and OS-9 that requires 80 columns and would not normally run on the Color Computer without modification. Check with PBJ if you are contemplating buying specific software. They'll let you know of any compatibility problems.

Wordpak provides a truly professional display, versatility and, sometimes, substantial memory savings. It is a quality piece of hardware, one serious Color Computer users would do well to consider. If you use OS-9 or Flex, put Wordpak on your Goodies To Purchase list.

— Norman Garrett

Editor's Note: Since this review was written, Wordpak has been enhanced.

Wordpak now supports full-screen editing in Basic. The user can now simply move the cursor anywhere on the screen and either insert, delete, or over-type characters.

The Clear key has been reprogrammed as the Control key, and only three display sizes are now supported — 80, 64, and 32 characters per line.

Wordpak is also compatible with Data Comp's version of Flex and Wayne Technology's CP/M board.

Gemini 10X Dot-Matrix Printer

Star Micronics, Inc.
Pan Am Building, Suite 2308
200 Park Ave.
New York, NY 10166
\$399

The Gemini 10X is Star Micronics' update of their popular Gemini 10 dot-matrix printer.

Both models are similar to most inexpensive dot-matrix printers now on the market. They handle 8½-inch wide (9½-inch with tractor holes) paper. However, the Gemini 10X comes with the tractor and platen feeds — they are not add-ons. The 10X is adjustable for multi-page forms.

In addition to the standard ASCII character sets, elongated, compressed, elite, and italics type capability, the 10X includes international character sets (American, English, German, Danish, French, Swedish, Italian and Spanish).

The Gemini 10X has one impressive capability — it lets you create your own character set. This means you can represent any or all of the standard alphanumeric characters, produce your own version of any or all of the other characters (\$ # % ? !), and use block graphics.

The 10X runs at 120 characters per second in the 10-character/inch mode. It has a self-test, and can print a continuous underline. The printer can backspace, and has programmable vertical and horizontal tabs. Other features? Seven- or 8-bit selectable interface, bit-image column scan, auto perforation skip, downloadable characters, and macro capabilities.

The Gemini printers all have parallel interfaces. Star offers an optional serial-to-parallel converter board that plugs into the printer and offers a serial plug. The serial I/O option is available with a 4K buffer. This, with the optional 8K buffer, offers you up to 12K bytes of buffer for nice spooling.

The 10-X will operate at any speed from 110 to 9600 baud. It is bidirectional in print mode (either text or graphics), except for certain optional print modes such as double-strike. However, the unidirectional capability is programmable if you desire it.

The nationwide chain of service centers put my mind at ease about technical help and replacement parts. I had a problem with the 10X's printhead — the service center sent me a new head in five days. Not bad.

The 10X comes with a manual that's 282 pages long. (If you get the short 71-page manual in the shipping box, you'll receive the larger manual when you send in your warranty card.)

This is some manual. It's amply illustrated with line drawings, and goes into great detail from unpacking the printer to creating character sets, software programming of the print modes, graphics, and operator maintenance.

Basic programs are included to demonstrate text printing and graphics creation.

They also demonstrate how to create your own characters and how to load them. You'll be referring to the manual

UTILITIES & HARDWARE

often if you do a lot of odd print modes and graphics.

One problem — you'll have to write your own graphics screen dump program. I got one that works great from Custom Software Engineering, Inc., 807 Minuteman Causeway, Cocoa Beach, FL 32931.

The Gemini 10X uses a standard Underwood typewriter spool ribbon. Although the manual recommends some Japanese ribbon that my local office supplier never heard of, it will use any 1/2-inch nylon #40 ribbon on a 4- or 6-hole spool (13 x 50 mm). Those ribbons cost about \$2.95 each. That's a lot cheaper than the specialty ribbons required by other printers.

Reliability? Star claims the printer is good for 50 million operations, and the printhead for 100 million operations. You can replace the printhead in five minutes. My 10X is still pounding away after a year of letters and papers and graphics.

Of course, line spacing is fully adjustable from 1/4 inch to 1 inch programmable steps. With the use of both emphasized print mode and the double-strike mode, you'll get print that is difficult to separate from daisy-wheel print. Try that with most other dot-matrix printers.

— Joseph A. Ryan



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DMP-120 Printer

Radio Shack
One Tandy Center
Fort Worth, TX 76102
\$499.95



Radio Shack has filled the gap between the DMP-100 and the DMP-200 with the DMP-120 printer.

Like all Radio Shack dot-matrix printers, the DMP-120 has two modes of operation: It can function in normal mode (printing text), or it can function in graphics mode (printing graphics only).

It is designed to handle either fanfold 9 1/2 by 11 paper (pin-fed), or single sheet 8 1/2 by 11-inch paper. It can also handle any form with dimensions of at least 4 but smaller than 9 1/2 inches (mailing labels, special forms). With the roll holder attached, it can also handle roll paper, an inexpensive way to print drafts and program listings.

It is a bi-directional printer with a logic-seeking head. That means it prints in both directions, giving it considerably more speed than the DMP-100 (the DMP-100 is rated at 50 cps, while the DMP-120 is rated at 120 cps). The logic-seeking head allows the printer to seek its print position most efficiently.

The printer will also handle three sizes of linefeeds (full feed, 3/4 forward feed and half-forward feed). This feature can come in handy when trying to use subscripts or superscripts (superscripts take some real planning, but they can be done).

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Color Computer/107

UTILITIES & HARDWARE

In the text mode, the DMP-120 will give you four options of type sizes and styles. There are two basic type sizes (10 characters per inch (cpi) and 16.7 cpi). In addition, an elongated form of each of those sizes is exactly twice the normal size (5 and 8.35 cpi respectively).

The DMP-120 does not have variable spacing, so all characters have the same space value. Block graphic printing can also be done from the text mode. This will not produce graphics identical to those on the screen because these blocks are set up with a different matrix.

The DMP-120 has four DIP switches on the back panel of the printer cabinet. Unfortunately, they are not in a very convenient location — directly underneath the paper being fed into the printer. For the Color Computer, the only switch you would likely use very often is the baud setting for serial input, where you have the option of 600 or 1200.

The printer also has a parallel port. To use the speed of the printer you

would probably want to obtain a serial-to-parallel converter and run in the parallel mode (I run print at 9600 baud for best throughput).

In fact, if you want to get fancy, you can set your printer up as I have: The RS-232 output goes to a three-way RS-232 switcher. One output from

**“Radio Shack
has filled the gap
between the DMP-100
and the DMP-200
with the
DMP-120 printer.”**

there goes to my modem, one goes to the DMP-120 serial port (it is needed for printing in the graphics mode) and the other goes to the DMP-120's parallel port via a serial-to-parallel interface. With that configuration, the only time I need to change the DIP switches is when I wish to switch from parallel input to serial for graphics printing.

The DMP-120 has a number of special features, including full underline capability and true descenders on the lowercase characters. The underlining (and most other features) are invoked by sending a CHR\$(X) command with a special ASCII code. The underline is turned off in the same way, using another code. That makes it possible to underline white space as well as characters. The line is printed at the same time the character is printed (that is because the 9 x 8 matrix is enough to allow for the underline in addition to the character with the descender).

It is even possible to combine text and graphics on the same print line. This is because the line does not change as the printer switches in and out of graphics mode.

DMP-100 graphics screen print programs will not work on the DMP-120. Be forewarned.

The cabinet that houses the DMP-120 is heavy-duty and very attractive. It comes with a roll-paper holder and feeder guide for the fanfold type paper.



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Documentation for this printer is adequate, but not geared for the Color Computer. Sample program statements are all aimed at other Radio Shack computers, as LPRINT statements are normally used. There is a reference to the fact that Color Computer owners should change LPRINT statements to PRINT#-2 statements, but that reference is easy to miss.

Also contained in the documentation is complete information on how to access the alternate (European-style) character sets.

In the six months I have had my printer, I have put it through the paces with some fairly heavy printing tasks. It has been totally reliable and has required no maintenance. The first ribbon lasted for 5 months although I used the printer almost daily for 1 - 2 hours of printing.

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— Norman Garrett

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The pen is attached to a three-foot cord with a standard joystick plug on the end, and is contained in a plastic housing (old housings were aluminum, which created problems). A soft rubber hollow plug in the end helps avoid scratching or marking the screen.

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on the pen's operation. If this lighting reflects off the screen it will change readings by two or three values, but that's well within acceptable tolerances. The pen is capable of reading a nearby bright light and will trigger a program selection. A too-dirty screen will cause it to misread light.

Colorware includes a six-program cassette with the pen. Four programs

**"I got readings
a bit lower than
those recommended."**

are games, one is used to adjust the brightness and contrast on your screen, and one is a drawing program. Each is selected from a menu with the pen.

The *TV Adjust* program is listed fifth on the menu but is the one you should use first. You need to adjust your screen's brightness and contrast settings for the pen to work properly. The program is self prompting, and the adjustments are easy. On my old set, with both brightness and contrast set as high as they go, I got readings quite a bit lower than those recommended, but still, all the programs worked.

Hangman introduces nothing new to the original Hangman concept. It asks you to guess the hidden word, and each wrong guess adds a body part below the hangman's noose. You select a letter by holding the pen on the blue square under it. A correct guess displays the letter wherever it fits into the word. Sound accompanies each choice. Wrong guesses are not recorded on the screen, so keeping track of them is your responsibility. There is no escape feature; you must either see the game through or hit the Break key.

In *Concentration*, you play a kind of alphabet match game. A touch of the pen to a square on the grid temporarily reveals a letter. If you can remember where various letters are so you can match them up once you find the same letter somewhere else, you're winning. A match leaves both letters exposed.

Quiz is a multiple choice test on state capitols. Choices are made, you guessed it, by holding the pen on the

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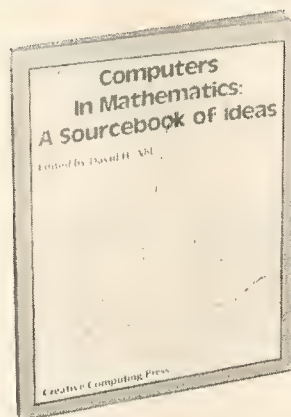
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appropriate square. State and capital names are in data statements, so you can reprogram and make up your own quizzes.

Draw needs a lot of help to be anything more than a curiosity. The object is to turn on low-resolution graphics blocks to create a picture. The program scans vertically with a white bar. When the pen registers a change, a white

“If I buy a light pen,
what will I do
with it?”

square scans horizontally until the pen registers a value change again. That square is then lit momentarily, along with the rest of the drawing. In a few seconds the entire screen reverts to blue, and the program resumes scanning. You can check your progress by pressing any key, and resume drawing with another key press.

Bug Chase isn't the same as catching fireflies on a hot summer evening, but requires as much coordination. It has four levels: slow, medium, fast and one for "speed freaks." A block of light flashes on the screen in a random location. You get 25 tries at each level to make a "capture" by touching the pen to it. At the slow level you have somewhere around 1 1/4 second.

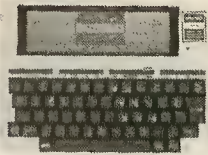
At the fast level you get about 3/4 of a second. I couldn't click the stop watch fast enough to determine the time at the "speed freak" level. I'm a bit concerned about the tendency to stab the screen with the pen in the excitement of making a capture. Someone who gets over-exuberant might damage either the screen or the pen.

The documentation contains a sample program to create a menu using the pen. It's not mentioned, but a knowledge of Basic is required to use this information. (The instructions don't cover any information on how to write programs with any colors other than white and blue, but do hint that light intensity is converted to digital values which can range from zero to 63.) But the documentation is adequate if you're simply going to use the pen and programs Colorware provides. After that, you're on your own.

— Gary W. Clemens

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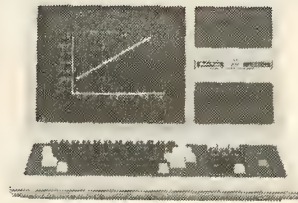
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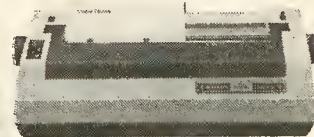
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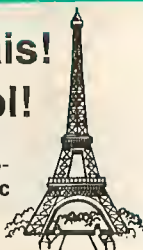
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The Graphicom graphics design package lets you draw, edit, transmit and print high-resolution screens using a powerful set of graphics tools.

For all its power and flexibility, however, the Graphicom package is easy to use. And the more you use it, the easier and more powerful it becomes. Graphicom consists of one boot/utility disk and one picture disk. The picture disk holds up to 26 high-resolution screens. The program lets you easily format more picture disks.

Hardware

To use Graphicom you need a 64K Extended Basic Color Computer and one disk drive with Disk Extended Basic version 1.1 or 1.2.

Drawing is controlled through one joystick and both fire buttons. If you have two standard Radio Shack joysticks, they will work better mounted. I used one standard joystick for lever and button control and one Kraft-type joystick as a foot switch control. I also tried Graphicom with the Radio Shack mouse — that worked well, as I was able to easily control everything with both hands. Cheshire Cat also supplies the schematics for interfacing the Color Computer to a Koala Pad.

Graphicom works well with either a color or black and white TV. It's a little easier to draw in detail with a black and white set, but color is definitely more pleasing overall. Cheshire Cat says the best results come with one monochrome monitor and one color monitor running simultaneously.

You can interface several other pieces of hardware as well. Graphicom supports graphics screen dumps to a fair number of printers, including Radio Shack's LP VII, LP VIII, DMP 100, DMP 200, and the CGP 115 color graphics printer. Other printers supported are the Epson MX-80, the Gemini 10, the C. Itoh 8510 and Okidata Microline 92.

Graphicom also supports communications over a modem at 300, 600 or 1200 baud. A dumb modem with an "answer-off-originate" switch is required. Some smart modems will not work with Graphicom.

Screens can also be saved to and retrieved from cassette. The cassette interface can also be used as a 1500-baud cassette modem. Cheshire Cat supplies a schematic for building a cassette modem.

What It Can Do

Graphicom has two modes of operation: the simple draw mode and the menu-driven control mode. The menu mode allows access to most of the drawing power contained within Graphicom.

The main menu selections are used for stamp control, computer screen selection, drawing color, screen mode, formatting new disks, screen dumps to printer, reception and transmission of data, and selecting the disk page menu. The main menu consists of 16 small high-resolution graphics pictures, one for each possible selection. To make a selection you position a box around your choice with the right joystick and hit the right fire button.

The disk page menu is actually a graphics disk directory, and is used for moving pictures between disk files and computer memory. The disk page menu consists of 30 graphics pictures, each representing a full high-resolution graphics picture. The first four selections represent workspaces that exist in actual computer memory. These workspaces are where drawing actually takes place. The rest of the selections represent actual disk files. To move files you position a box around your choice with the

right joystick and grab the file by depressing the right fire button. Now use the joystick to position the box on the file or workspace you want to copy to and release the fire button.

When you are not using menu control you are in the simple draw mode. You can return to the draw mode any time by releasing both fire buttons.

In the simple draw mode you are in one of the four high-resolution workspaces. Within those screens you have a drawing window that's roughly 60 by 60 pixels. A crosshair cursor within it is controlled by the right joystick.

The draw window gives a one-to-one correspondence between cursor position and joystick position. If you move the cursor to the side of the draw window, the window will start to move, so you can drag the draw window to any part of the screen.

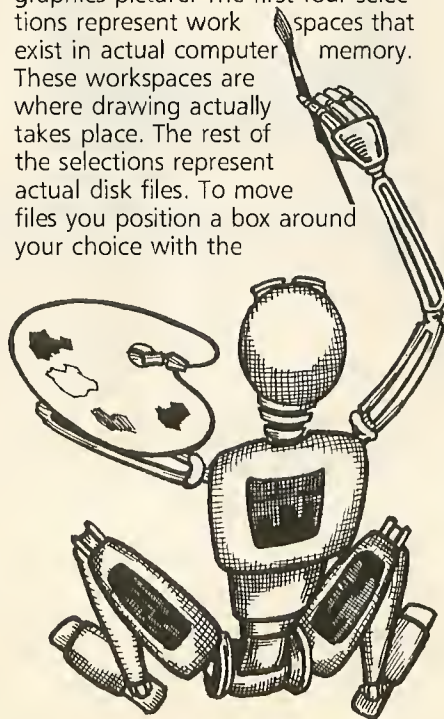
Drawing is achieved by using the right fire button as a pen button. First position the cursor to where you want a line to start, then depress the pen button. As you move the cursor a line will flash between the starting cursor position and new cursor position. When the line is where you want it, release the pen button and the line remains.

To draw single pixels, position the cursor and tap the pen button. Text can be placed on the draw screen with the keyboard. The arrow keys move a text cursor to position text placement. This is the only function that the keyboard is used for.

The real core of Graphicom's flexibility lies in its stamp functions. This feature lets you define any portion of a predefined picture as a stamp. Stamps can be placed onto any other picture, rotated, mirrored, or grouped into stamp sets.

The opaque stamp option places all the stamp pixels directly on the screen. The clear stamp option ANDs the stamp with the current screen picture. The mask stamp option ORs the stamp with the current screen, and the reverse stamp option XORs the stamp with the screen.

You can also use a stamp as a paint brush by holding down the pen button and dragging it around the screen. Stamps can be defined as sets and used as such when placed in workspace 4. The stamp set function allows functionally similar stamps, such as flow-chart symbols or electronic schematic symbols to be grouped together for easy access.



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The stamp functions offer almost unlimited flexibility in graphics design. The keyboard fonts and printer set-up are contained on graphics screens. To change the fonts or create new ones you simply load the fonts screen into workspace memory and edit away.

The screen can be set to any of the high-resolution graphics modes. Screen draw color is also set through menu control. Draw color is a simple on/off switch. All drawing is in black or white, though many colors can be achieved through color artifacting. The select/animate menu option allows you to select which of the four memory workspaces currently is your drawing screen. This option allows you to page these four workspaces at up to 60 frames per second, allowing for some simple animation.

The copy/format option lets you make more picture disks, which you will definitely want to do. As the main menu, disk directory and keyboard fonts consist of graphics screens, they will be copied onto the new disk. To make a copy of a picture disk, including pictures, use the Disk Basic Backup command.

Graphicom Utilities

The utilities included with Graphicom are worth more than passing attention. They are separate machine-language programs that will interface with the format of a Graphicom picture disk.

The GC>BIN utility allows storage of Graphicom pictures as binary files on standard formatted disks. This allows you to use the pictures with your own Basic or machine-language programs.

The BIN>GC utility allows you to pull pictures out of any location in computer memory and put them into Graphicom format, so you can pursue memory in 512-byte increments and pull the pictures from other programs.

A third utility, SUXPIX, lets you break out of some auto-restart programs.

The final utility, BIN>ASC, is a public-domain program that converts pictures to ASCII files that can be transmitted through standard bulletin-board-system protocol.

Gripes

There were a few things I didn't like about Graphicom. First, four-color

drawing is done only through artifacting. This takes a little getting used to. Second, the joystick control may be a little too sensitive or inaccurate in the simple draw mode if you're not artistically adept. This can probably be compensated for by defining a font of graphics characters, but I'd still like to see a keyboard draw option.

My wish-list of features? Game designers would like to be able to save the stamp images separately from full screen pictures. This feature would be best if it included stamps in pre-shifted format with an option of either an assembly source table form or a binary form.

For the business user, the ability to format a screen to be dumped to a full sheet of paper would help. Graphicom has all the tools for designing any kind of business form along with text, but the small picture dumped to printer would not suit many business applications.

Bits and Pieces

The documentation is complete and fairly well-written. It jumps around in places, but all the information you'll need is there.

Graphicom is written in Forth, and the source code is available for you to study if you contact Cheshire Cat.

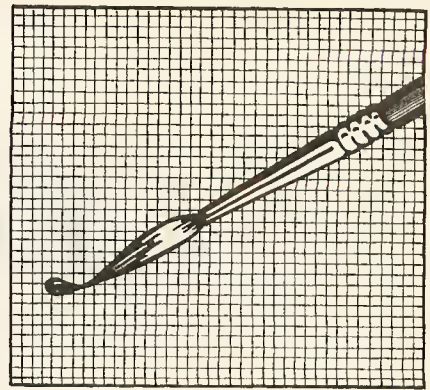
"A Graphicom picture exchange is available."

Cheshire Cat also wants you to send them pictures you have designed with Graphicom. In return they will send you a picture disk of other pictures they have received. Another Graphicom picture exchange is also available.

Cheshire Cat has also interfaced Graphicom with a video digitizer. The schematics for this may also be published at a future date.

Graphicom is an excellent graphics package that provides more quality software per dollar than most other software packages. Buy it instead of your next game. You won't be sorry!

— Richard D. Uglum



Paintpot

Tim Skene
6073 Durocher Avenue
Montreal Quebec
H2V 3Y7 Canada
(514)277-3366
\$20 cassette, \$25 disk

If you own a Color Computer, you probably wish you could produce neat drawings easily, without all the PMODE and Line and Circle hassle which Extended Basic requires.

Paintpot allows you to do just that. The program also features animation, text labels on the graphics screen, and an on-screen palette.

All Paintpot's graphics screens are in PMODE 1, giving you a resolution of 126 by 94, and either two screens with a 16K Color Computer, or four with a 32K or 64K machine. At the bottom of the screen is the palette holding four boxes of color (white, green, blue, and red).

The arrow keys move the cursor around on the screen, and its speed is adjustable. To select a color to paint with, you just dip the cursor into the proper box at the bottom of the screen. Holding the Enter key down while moving the cursor actually draws the current color on the screen, and holding down the Clear key erases whatever the cursor is moving over.

Paintpot also works with a joystick or the Color Mouse. Pressing the button will draw, and pressing the Clear key will erase what you are moving over. I found drawing with a joystick good for making very abstract doodles, but not very easy to use for detailed work. The Color Mouse was a little easier to use to draw accurate pictures.

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REAL EIGHTY-COLUMN DISPLAY!
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 Works with either the WORD-PAK from PBJ or
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This program is the **ultimate** in coco communicating!! **Ultra Term +** is used with a plug-in 80 column board* that gives you **True 80 columns**, not the graphics display that is unreadable at 80 columns. This is truly a **Professional Package** that is so easy to use that once you have used it, you'll wonder why other packages are so difficult to use, (except for Color Term + Plus + that is!) After using a terminal program that cannot give you **True** mainframe terminal emulation, you will find **Ultra Term +** indispensable! **Ultra Term +** even has a host mode that allows you to echo characters like full duplex mainframes do! There are also 10 macro keys which will allow you to save passwords, phone numbers, modem programming information, etc. + **PLUS +** you can save them to tape (Rom Pack, Tape Versions) or disk (Disk Version). Also, like all **Professional** terminal programs you can save your current parameters. This saves you set up time when moving from one system to another. + **Plus +** when used with the parallel printer port** you can print either what is coming in, or print what you saved in your space buffer (64K systems only support the space buffer option) if you like. And what about documentation? Every feature is explained in detail and indexed for fast look up! There is also a comprehensive help section to aid those unfamiliar with telecommunications. Although this program was designed for the Professional a total novice can use it with ease. Check all the features listed below and then you decide who has the world's smartest terminal!

Baud Rates: 110-4800 (communicate)
 600-9600 (printer).

Screen Format: 80 x 25 w/true upper & lower case.

Select half, full duplex or echo.

Select odd, even, mark, space or no parity.
 Send all 128 characters from keyboard.
 Select 7 or 8 bit words.
 Select 1 or 2 stop bits.
 Send a true line break.
 Select all caps if needed.
 Automatic capture of incoming files.
 X on/X off capabilities.
 Merge text or programs in buffer.
 53,000 character buffer (64K).
 Split buffer option (64K).
 10 macro keys.
 Four buffer send modes (dump, prompted, manual & time delay).
 Buffer size indicators (bytes used & bytes remaining).
 Buffer editor w/auto key repeat.
 Scroll forward & reverse to view buffer & print viewed screen option.
 Selectable printer formats (line feeds, etc.).
 Selectable trapping of incoming characters.
 Print while receiving data*.
 Spool received data while receiving more (64K).
 Buffer editor has these features:
 Move forward and reverse through buffer. Insert, type over, delete lines or characters.
 Block deletion or start to end of buffer delete.
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 Use 1-4 disk drive (w/SAVE, LOAD, DIR. & granule display).
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 Comprehensive users manual.
 Works with ALL Radio Shack™ Disk Systems and all models of color computers.
 Still not convinced? How about a 15 day, money back guarantee? If you don't like the package for any reason, we will refund your money upon return of a like-new package.† Who out there is offering

you this kind of deal? And customer support was never better. Simply fill out your registration card and send it back to us and you will be notified when new features, improvements, etc. become available because all registered owners will receive **Free** upgrades for a \$5.00 shipping and handling fee).

As with all good Professional programs, **Ultra Term +** is all machine code. This program has been tested by those both familiar and unfamiliar with communications programs. And when you call for some technical support, you won't get an answering machine during our business hours (10-5 CST M-Sat.) under normal circumstances. Technical help is usually available all day.

Note: Color Term + PLUS + should have all of the same capabilities described above by the time you read this ad, but call first to make sure. **Ultra Term +** is ready to ship now.

PRICE: Ultra Term + — \$55.95
 (Disk/Tape)

Color Term + Plus + (V5.0)
 \$45.95 (Disk/Tape)

Word-Pak (Includes a software driver so you can use your basic programs with no modification in most cases!)...\$139.95 + \$3.00 S&H

Y-Cable...\$29.95 (Required if expansion port not used with disk drives)

Complete Package **Ultra Term +**, Word-Pak & Y Cable [subtract \$20.00 if not needed] is only **\$210.00**

***Ultra Term +** supports the 80 column board made by PBJ, Inc. If you already have the board, simply order the program, but those of you who don't can get a good deal.

**Parallel Printer Port from PBJ, Inc.

†Less \$10.00 restocking charge.

Canadians
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 P.O. Box 11932
 Edmonton, Alberta.
 (403) 421-8003



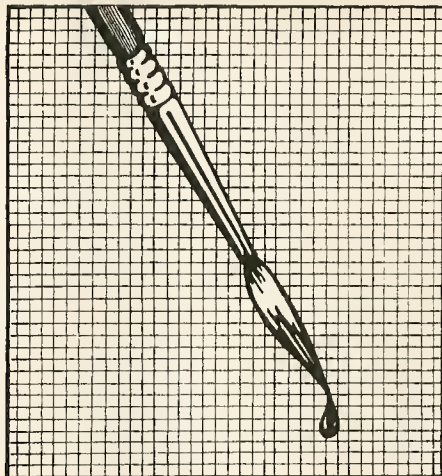
Double Density Software
 920 Baldwin Street
 Denton, Texas 76201
 Phone 817/566-2004.



If you find it hard to draw lines with the joystick, Mouse, or keyboard, there is a command that will draw perfect lines for you. Just select the two end-points of the line and press L. Actually, the L command will draw a line from the cursor position to the last dot drawn. Pressing Clear and L will erase a line by drawing a white line instead of using the current color.

Paintpot makes it just as easy to draw boxes, too. Selecting the opposite corners of the box and pressing B will draw a box in the current color, and pressing Clear and B together draws a white box.

Since most people can't draw accurate free-hand circles, Paintpot includes a Circle command. Select the center of the circle and a point on the circle itself, and press C. (Since this command uses the Extended Basic Circle command, the circles it draws are actually ovals. If you find this annoying, you could modify the Basic program to produce perfect circles.) Concentric circles can be made by moving the cursor farther out or in and pressing C. Again, circles can be erased by pressing Clear and C together.



These boxes and circles are not filled in, however — they are just outlines. To fill them in, you must use the Paint command. This command will Paint an area in the current color, using the current color as its border. For example, if you draw a red circle with the Circle command, move the cursor inside the circle, and press P, Paintpot automatically fills in the circle with red. If you want to paint in something other than the current color, without dipping into the palette, you can press a number

from 5 to 8, corresponding to white, green, blue, and red. This will paint an area in that color with that color as its border, but will leave the current color unchanged.

There is a danger with using the Paint command, however. If you draw a red circle, and press 7, which means paint this area blue, the paint will spill out over the edges of the circle, and fill up the whole screen with blue. This is not a bug in the program. The Paint command just makes everything blue until it hits a blue edge, and the red circle was just another thing to paint over. This is something to watch out for, as a leak can destroy a painting you've worked some time on.

There is, however, a limited form of insurance available. Pressing D duplicates the current screen onto the next screen. Do this before a potentially disastrous Paint to help preserve your work.

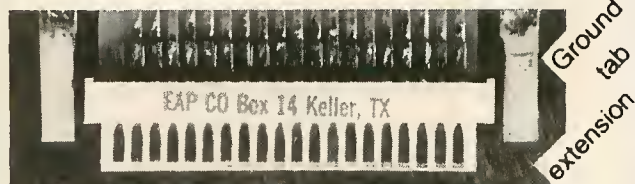
This Duplicate command in conjunction with the Animate command provides limited animation. Drawing a picture on the first screen, duplicating it to the next screen, and making a slight change in the picture will provide

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UTILITIES & HARDWARE

a short (two- to four-frame) cartoon. Pressing A will display all the screens in sequence rapidly, so you can make a little man wave his arm, or make letters walk across the screen.

Paintpot provides text capability with the @ command. The cursor switches from a block to a horizontal bar, and you can type any letter, number, comma, or period on the screen in the current color. The special characters like ! and ? must be drawn in by hand at speed 1 in the keyboard mode. This text mode allows you to label (or sign) your best works of art. In the text mode, you can have up to 15 lines of 31 characters each on the screen.

Paintpot allows you to save these doodles to either tape or disk so you can finish them later. The screens are saved using the CSAVEM or SAVEM commands, so any pictures you create can be used by other Basic programs. The documentation describes this procedure, and also tells you how to transfer screens from tape to disk, should you later upgrade your system.

The documentation for Paintpot is excellent. Not only does it explain how to load your drawings without Paintpot, it also describes the program's commands fully and in an easy-to-understand manner. The manual is 16 pages long, not including the Table of Contents and the control key summary (a quick-reference guide that many manufacturers would do well to copy).

However, I do have one reservation about Paintpot. The manual states that in the joystick mode you can "draw and correct with just the joystick." This is accomplished by erasing the current color when the cursor moves over it. What this means is that after you've painted in a box or circle and you move the joystick back over the filled-in area it leaves white holes in it. The documentation makes it very clear that that is what will happen, and that this is a desirable feature, but I find it aggravating. For this reason, I do most of my drawing in the keyboard mode.

Despite this "feature," I can recommend Paintpot to anybody who wants to create graphics easily, and

with a minimum of hassle. This is an excellent program, and Tim Skene is to be congratulated for giving the purchaser some very professional documentation.

— Gary Teter

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Atari	B	M
Commodore/PET	C	N
Digital Equipment/DEC	D	O
Heath/Zenith	E	P
IBM	F	Q
Radio Shack/Tandy TRS-80	G	R
Color Computer	H	S
Other Tandy/Radio Shack	I	T
Other (specify)	J	U
None	K	V

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- 9. Radio Shack computer center
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Heath/Zenith	E	P
IBM	F	Q
Radio Shack/Tandy TRS-80	G	R
Color Computer	H	S
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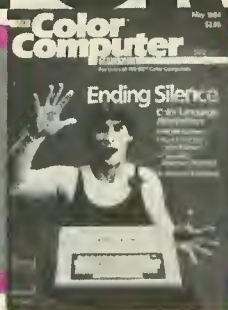
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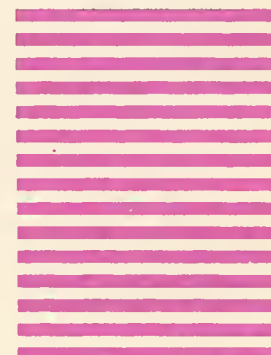
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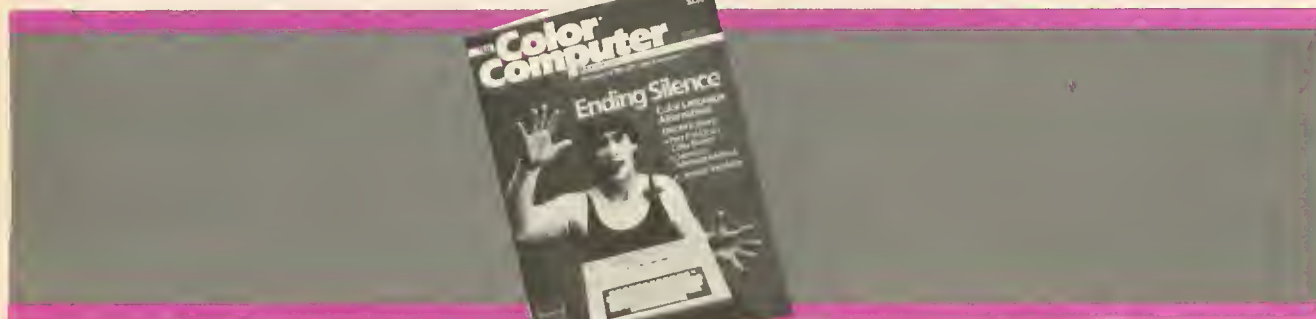
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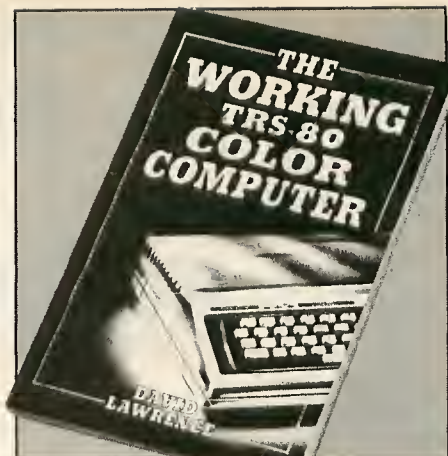
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or key chart can be superimposed on any of the charts (except a pie chart, which automatically creates its own legend for each pie sector).

The program is easy to run from the disk by simply typing RUN "DOS". From there you follow the menus. However, it is absolutely essential that you follow the Users Guide; the choices and inputs requested will not always be obvious. This is particularly important when entering information like size, color, shading, and image reduction.

The 86-page Users Guide is superbly written and nicely packaged in a 3-ring binder. It is lucid and well organized. Its only flaw is the lack of an index.

I found one small glitch in the Pie Chart option: the pie slice number was not displayed when entering the data. In all other cases (bar charts, line graphs, scatter point graphs), the analogous function worked properly.

You can display charts on the screen in 4-color low-resolution, or 2-color high-resolution mode and on black and white or color printers with graphics capabilities.

Disk Graphics has a feature called "Superscreen," which allows you to produce a chart on a much larger scale. Then you can display smaller portions of the "Superscreen" one segment at a time.

The charts can be printed on dot-matrix printers with graphics capabilities. This feature should permit display of the "Superscreen" with excellent resolution (up to 999 by 950). My printer (a Gemini 10) has graphics capabilities; however, I was unable to get Disk Graphics to print charts with it. The Users Guide does not address the issue of printer differences, an unfortunate problem for computer novices.

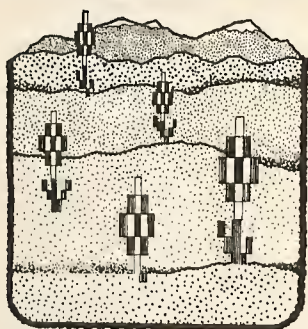
Disk Graphics must swap portions of the program off the disk to fit everything in 16K machines. This is slow, but I was impressed that the program works at all in 16K.

— Raymond D. Mosteller

Programmer's Sketch Pad

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\$12 a pair, including pen

Have you worn out the screen grids in the appendix of your Color Basic



manual? Or are they untouched because they're too confusing, frustrating, or just plain bulky?

Well, now there's the Programmer's Sketch Pad — a complete, easy-to-use screen locating aid permanently laminated in heavy plastic.

You can write on it in grease pencil or erasable ink felt markers (one erasable pen is included), or lay transparent paper tracings over it. Either way, you read the screen locations directly from the grid — no fussy calculation or tricky projection of grid lines is required.

One side is numbered for use with PRINT@ commands, and is complete with the 16 graphic character shapes paired with their character values. There is also a reminder that the top row of numbers is equivalent to the TAB columns.

The other side has a grid double-numbered for use with the X, Y format of SET, RESET, and POINT commands. Also shown are the colors available and their number values, and which numbers from the grid and color table go where in the SET command.

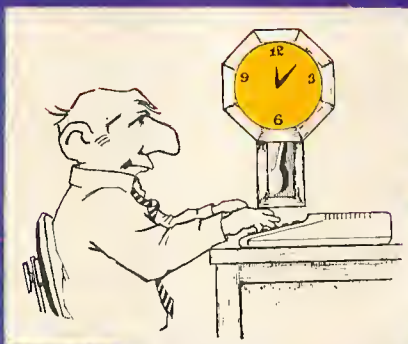
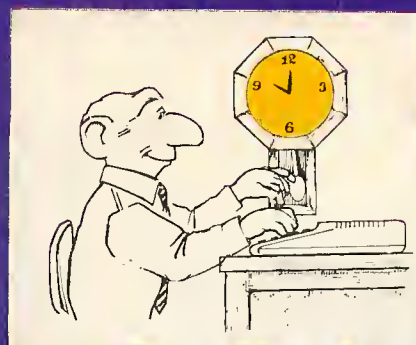
You'd expect that to be it, yet the Sketch Pad comes with 11 pages of documentation. A full page describes each side of the Sketch Pad. Three sample programs, each using PRINT@ or SET/RESET extensively and each heavily annotated, are also included. There are even suggestions for customizing the programs.

Having two pads is handy for working with both text and low-resolution graphics at the same time without constantly flipping the pad over. The two grids are not exactly the same size, so you won't get exact results when using the same transparent paper tracing for both grids. The pen doesn't smear, yet it can be rubbed off with a dry tissue.

If you don't sit on the pads and crease them, they should last a long time, even with the heavy use they're bound to get. Why didn't Radio Shack think of this?

— J.T., Color staff

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BY TERRY KEPNER



I'm running Color Scretsit from tape, and using the DMP-100. The printer is capable of operating at 1200 baud, but Scretsit only works at 600 baud.

Radio Shack said it was possible to alter Scretsit, but that they didn't officially support it. Do you know how I can do this?

— D. M., Moundsville, WV

ROMpak Scretsit expects the baud specifier to be at CE11 hex, which is E11 hex above its starting point at C000.

Since you don't mention how you got Scretsit on tape I assume you used some type of transfer program to accomplish this task. You need to retransfer the program from cartridge to tape, changing the value of location CE11 hex in the process. For 1200 baud, use the decimal number 41.

I have a 16K Color Computer with Extended Basic. I would like to upgrade to 64K and add disk drives.

Can the regular disk language be used on the 64K? And can the disk language be combined with OS/9?

Also, can Atari video games be used on the Color Computer with a special adapter and converter?

— W. F., Cheboygan, MI

If you buy the Radio Shack disk system, you'll be able to use standard Basic, Extended Basic, and Disk Basic all together. Their design allows full use of the ROMs and the cartridge Disk Basic ROMpak. The only constraint is that you won't be using the full 64K RAM, only the lower 32K bank. The upper 32K RAM bank is displaced by the Basic ROMs and disk controller ROMpak.

If you decide to use OS/9, then the full 64K RAM is used, and the built-in Basic ROMs (standard and Extended) are switched out and ignored. Also ignored is the disk controller ROMpak Basic. Because of this, the entire Basic language supplied with the Color Computer and disk controller ROMpak can't be used with the OS/9 system.

If you want to use Basic programs with OS/9, you have to get OS/9 Basic.

To the best of my knowledge, there aren't any adapters for using Atari cartridges or games on the Color Computer. I don't think we'll see them either, since the Atari uses the 6502 CPU chip and the Radio Shack uses the 6809 CPU chip. The differences between these two are rather significant and can't be easily overcome.

I have an Extended Basic Color Computer 2. How do I convert it to 64K?

— E. H., Hemet, CA

First, you can take your machine to the nearest Radio Shack Computer Center and have them install the upgrade.

If you're adventurous, you can perform the work yourself.

Remember, though, that you void the machine's warranty when you open it.

It's important to remember that chips are very sensitive to static charge. Your work place should be scrupulously clean, and not carpeted. Ground yourself (such as to the outside of the TV connector) before you even think of picking up bare chips.

Here's how you add the chips: buy eight 64K RAM chips, open the Color Computer 2 case, and gently unplug the keyboard. Find the eight sockets, with chips in them, labeled U14 to U21 (the labels will be on the printed circuit board beside the sockets).

The memory chips will all have a notch in them at one end. That notch indicates which end of the chip has pin 1 on it. In the Color Computer 2, the notches on all the chips face the same direction. The notches on the memory chips should be pointed away from the keyboard.

Remove the eight chips by gently prying them up with a very small flat-head screwdriver or a nail file. Solder a jumper wire from the solder pad labeled W1 (located between U6 and U7) to the solder pad to its right.

Now, install the eight new chips. Be careful that you don't bend any pins under the chips — plug them into the socket.

Plug the keyboard in, reassemble the case, plug it in, turn it on, and type PRINT MEM. The computer should respond with 24871. Now type POKE 25,6:NEW. PRINT MEM should respond with 31015. Finally, type CLEAR:MEM. The computer should respond with 31215. You now own a 64K Color Computer 2.

If the usual screen doesn't appear when you turn on the computer, or you get different answers, unplug the computer, disassemble it and recheck your upgrade work. Look for bent pins on the new RAM chips, or chips installed backwards.

If nothing seems wrong, remove and inspect the 64K chips and then re-install them. Test the computer once again. If you still can't get the right responses, remove the 64K chips, cut the jumper wire, re-install the 16K chips, and make sure the computer is still working properly.

If re-installing the 16K chips doesn't restore proper operation, something inside the computer has failed and you'll have to take it to a technician for repair. If they work, then one of the 64K RAMs may be defective — return them for a refund or replacement.

I would like to share my solution for the Color Computer going on the blink due to temporary loss of the +5 volt dc supply.

In my revision D computer the culprit was R66, a 1/3-ohm 2-watt resistor. To allow for a little heavier current draw after adding expansions, I installed a 33-ohm 1/2-watt resistor in parallel with R66. Since this modification I've had no troubles with the +5Vdc line.

— D. N., Arcata, CA

Thanks for that tip.

My Color Computer was originally a 16K standard Basic ROM 1.1. I've upgraded it to Extended Basic 1.1 by adding the additional ROM chip. How can I find out what board revision I have?

I have also discovered a problem in using an Okidata 82A printer with the Color Scretsit ROMpak. The instructions that came with my computer included a note for Color Basic 1.1 pertaining to the 7/8 bit option on a Line Printer VII. The option allows you to print graphics by setting the switch to 8 bits.

Setting my printer for 8 bits lets me list programs correctly. However, when using Scretsit, the 82A prints garbage. Setting the printer



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D.S., Kentucky

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M.S., California

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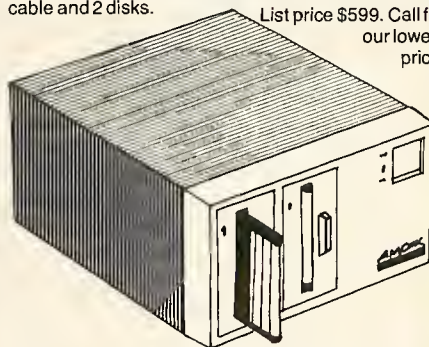
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to 7 bits allows **Scriptsit** to work properly, and still list programs without problems. Is the printer adding the extra bit when it sees a 7 bit code?

I've also found that setting the printer for the TRS-80 character code produces a Right Arrow in place of the exponential function caret. When I reset the printer to standard ASCII, the correct caret character prints.

— W. H.,

Cleveland Heights, OH

To determine the board revision you have, remove the screws in the bottom of the computer and take off the case top (this voids your warranty).

Look on the right side of the printed circuit board, between the ROMpak port and the keyboard. You should see a serial number followed by a letter. The letter indicates your computer's revision type. If a letter isn't there, you have the board commonly labeled F.

No, the printer doesn't add an extra bit when it receives a 7 bit code.

The problem with your 82A is that **Scriptsit** sends only 7 bit codes to the printer. The printer, expecting to receive 8 bit codes, quickly gets out of step with **Scriptsit**, and garbage results. The only solution is to switch the printer to 7 bit mode whenever you want to use **Scriptsit**.

Do you know if there's a book similar to *What's Where In the Apple* that lists all the Color Computer's memory locations and their uses? I really enjoy using assembly language and such a book would be a big help.

— G. S.,

New Martinsville, WV

The Color Computer Magazine has a multi-part disassembly of both Color Basic and Extended Color Basic, starting in the July 1983 issue. The

April 1983 issue has "The Map," a guide to the first 512 bytes of RAM, the area reserved by Basic for special purposes.

Spectral Associates (3416 South 90th, Tacoma, WA 98409) sells a set of books covering the Color Computer ROMs: *Color Basic Unraveled*, \$19.95; *Extended Basic Unraveled*, \$19.95; *Disk Basic Unraveled*, \$19.95. All three are available for \$49.95.

Spectrum Projects (93-15 86th Drive, Woodhaven, NY 11421) sells the "Color Computer Memory Map" by Bob Russel for \$12.

Applause is in order for the 64K upgrade instructions in the October 1983 issue of *The Color Computer Magazine*.

While performing the upgrade on an E board I noticed two problems: instruction 4 tells you to move the jumper below C44 to the 16/32K position. The computer and technical manual show the 4/16K position, but no 32K position. Where is it?

Secondly, instruction 6 requires that I solder two staking pins next to U29. I find three pins next to U29. Which two do I solder?

— J. G.,

Steamboat Springs, CO

The jumper in question (made of three staking pins and a 2-pin-wide jumper connector) has a 4K position and a 16/32K position (labeled 16K). Just move the jumper to the 16K position. The technical manual, unless you asked for the addendum for the revision E board, only shows the diagram for the D board.

The staking pins next to U29 are designed to use the same jumper connector as above. Solder the pin labeled "low" to the center pin.

I purchased the Disk Graphics program from Radio Shack. This program is everything I expected it to be, except it won't work with my DMP-120.

Radio Shack simply states that this program won't work with the DMP-120 printer. The program manual states that it will work with all Radio Shack dot-matrix printers with graphics capabilities, of which the DMP-120 is one.

Radio Shack offered to refund my money for the program, but I really enjoy the graphics this program produces. Do you know any way to get the program to work with the DMP-120 printer?

— C. M., Cut Off, LA

Sorry to hear about the problem, but I can't help you. Does anyone else have a solution?

I have three HM66116LP-3 static RAM chips but don't know the pin-outs for them. Can I put one into the socket for the Extended Basic ROM and expect it to work?

I also have eight MCM6665AP15 chips, but am afraid to put them into the Color Computer. *Microprocessor's Data Manual* says that for 0000H to FFEH "S=0 if R/W=1, but S=3 if R/W=0 for C000H to FFEH, S=2 if R/W=0 for A000H to 8FFF, and S=1 if R/W=0 for 8000H to 9FFFH" (page 4-648 and 4-649). Does this mean that the upper 32K RAM is Read-only and a Write to these locations will be to the Basic ROM or cartridge port ROM?

Your magazine has given instructions on installing these 64K RAMs that infer I will have use of all 64K RAM. Can you explain this seeming contradiction?

— T. D., Ontario, Canada

The static RAMs, which are 2K, won't work in the Extended Basic socket. First, that socket is wired for an 8K chip. Second, the pin-outs aren't precisely compatible; I don't have pin-outs for them or I'd print them for you. Third, the SAM chip expects to see a ROM chip at that address, and writing to ROM doesn't accomplish anything.

This leads to your second problem: the SAM chip holds two fixed memory maps. The first map divides the 64K address range (0000H to FFEH) into two sections: a lower read-and-write bank of 32K RAM and an upper read-only bank of 32K ROM. The second map is a 64K all-RAM read-and-write section. To switch from one map to another is simple — write anything to FFDF hex to set the computer to the 32K RAM/32K ROM map, and write anything to FFDE hex to set the SAM to the 64K RAM mode.

The problem is that by switching to the all-RAM mode you automatically lose all access to your Basic ROMs. If you POKE &HFFDE from Basic your computer stops working (don't forget that the ROMs tell the 6809 CPU how to talk to the keyboard, video, cassette, joysticks, and disk drives, if you have them).

What all that really means is that the computer is usually divided into two distinct operational modes — the normal 32K RAM with 32K ROM Basic, and an optional all-RAM section, where the ROMs have been switched out with RAM replacing them. This is what the Motorola manual was trying to tell you.

Practically speaking, if you want to use the full 64K RAMs, and don't make any ROM calls for data I/O (input/output), you can load your machine code program from cassette or disk to RAM (which by default is the lower 32K). When you execute the program, the first thing it should do is switch out the ROMs, automatically switching in the RAMs.

If you want your program at the top of memory, the next step would be to have your program move itself from the lower 32K bank to the upper 32K bank.

Since the ROMs are no longer available to you, your program must contain all its I/O routines. ■

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All programs require a 32k Disk with at least one disk drive. PRO-COLOR-FORMS and PRO-COLOR-DIR require PRO-COLOR-FILE to be used. All programs (c) 1983 by Derringer Software, Inc.

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END OF FILE END OF FILE END OF FILE

Whenever we buy a non-Radio Shack product we almost always buy it through the mail, often without ever having seen or used the product firsthand. We are trusting people.

We at **The Color Computer Magazine** occasionally receive mail commending or condemning an advertiser for excellent or abysmal mail-order service. Most of the mail is of the praising variety. We can assume that the lack of condemning mail reflects the lack of problems you have had in dealing with our mail-order advertisers. That is good, and as it should be. The people who make products for our Color Computer are worthy of our trust.

When that trust is abused, however, it casts an ugly shadow on the way everyone else does business. Almost every I-had-a-bad-experience letter we receive makes a statement similar to, "I'll think twice or three times before placing another order with a mail-order advertiser." In the mail-order business it's possible to have one bad egg spoil the basket. And that's not right.

If a corporation successfully bribes a public official does that mean all corporations and public officials are corrupt? No. If I fly Delta and have a bumpy flight does that mean every time I fly Delta the ride will be frightening? No. Then, if Mail Order Inc. is slow to refund my money for one of their products, does that mean Buy By Mail Inc. is also slow? No.

Because you have limited in-store shopping opportunities for Color Computer products, manufacturers and mail-order vendors must be accountable to your concerns. Almost everyone in the market today is doing so. When a bad egg turns up all of us must work together to fix the problem.

In the past we have dealt with prob-

lems by serving as a consumer advocate for our readers. When a complaint letter comes in this is what we do: The complaint is evaluated. If it deals with a refund or the customer has waited a reasonable time but no product has arrived, we send a copy of the letter to the vendor with a letter from us asking that the vendor fix the problem and let us know what they've done and when they've done it. We also write to the reader letting them know we've taken this action and ask them to contact us again if the problem isn't resolved soon.

If the complaint deals with product performance, we make a judgment on the legitimacy of the complaint. Since we are familiar with most products, we are usually aware of their good and bad points. If we feel the reader is expecting more than he should from the product we write and say so. Once again copies of the correspondence are sent to the vendor. If we feel the complaint is justified, we forward the customer's letter to the manufacturer along with a cover letter from us requesting satisfaction.

In each instance we merely attempt to arbitrate a reasonable settlement; either to attain satisfaction for the reader, or to defend the vendor.

But when a problem comes to our attention that has, or will, affect more people than just the letter writer, we take even more decisive action.

Copies of the correspondence are sent to the vendor. A letter from us requests a response for publication alongside the complaint letter(s). If we do not receive a response in a short but reasonable amount of time, we follow up with a phone call. Once the response deadline has passed we prepare the letter and vendor's reply (if

there is one) for publication in the next issue of the magazine. It is then up to you to decide whether the vendor's response is satisfactory, or proper amends have been made.

If we feel the infraction was unusually bad, the chances of improvement very remote, and many readers likely to be adversely affected, we cancel the vendor's advertising contract, eliminating his access to you.

Producers of Color Computer software and add-on devices have an excellent track record for providing good service via the various postal services available. We have not had to publish very many letters complaining about mail order service. We are not consumer advocates by trade, we are information publishers. We are Color Computerists. We don't have to play Consumer Police very often, but we will whenever you let us know of a problem.

The Color Computer Magazine is published for, and written by you, our readers, not our advertisers. It is your interests we consider before doing anything — absolutely everything. Our advertisers, including Radio Shack, speak to you via their advertisements and continued Color Computer support. It is our purpose to share information and entertain you, user to user; and it is our intention to teach you, enthusiast to enthusiast.

Before you buy always carefully read the product's advertisement to be sure its stated claims meet your needs. Then check for a review of the product in your issues of **The Color Computer Magazine** to see how we felt the product stacked up against its advertised claims. If all is satisfactory, then order through the mail with confidence.

— K.L., Editor-in-Chief

FOR NEXT (09,84)

September heralds the return of school days, and teachers and parents are busily preparing for the upcoming educational year. To get you off to the right start, be sure to read our annual Education issue, next month. Some old favorites will be with us — Lynn Davis with a teacher's electronic gradebook; Craig Dickenson with advice for parents on The Information Age; Norman Garrett with hints on how to buy educational software; and two young fellows from the Asa Adams School who have some very realistic ideas about what's hot (and what's not) in education software. Be sure to get this issue for your library — these are just a few of the gems we have ready for you!

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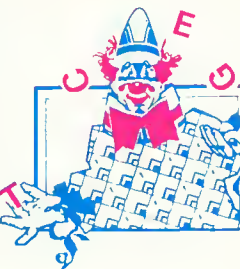


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ABC'S IN COLOR

In the ABC program, all 26 letters spring up in color to the familiar ABC tune. Then, colorful detailed pictures depicting each individual letter of the alphabet appear one by one. Your child's fascination will mount as he or she correctly presses the letter on the keyboard and is rewarded with a musical tune before the next detailed picture is drawn line by line onto the screen: AIRPLANE for A, BUS for B, CLOWN for C and so on to ZEBRA for Z. Truly a must program for the preschool to first grade age group!

CoCo 16K ECB Tape: \$19.95 Disk: \$25.95



CRISS—CROSS MATH

As the program begins, your child is presented with a nine square playing board. It is your choice as to which square you choose. After a choice is made, a MATH PROBLEM appears in the square. You score your first X by answering the problem correctly. If your answer is incorrect, the square clears and your opponent is allowed his choice of squares. The game is over when three squares vertically, horizontally, or diagonally are won by the same player. When playing against the computer, every answer you get wrong is won by the computer. Multi-level ADDITION AND SUBTRACTION program.

CoCo 16K Tape: \$12.95

FRACTIONS

SIDE ONE: Fraction Lessons, explains fractions with the aid of graphics. Child studies the different ways fractions can be represented. Lessons include:

- IMPROPER FRACTIONS
- MIXED FRACTIONS
- PROPER FRACTIONS

Many educators have praised the use of motion and color to display the fractional equivalents.

SIDE TWO: Fraction practice, offers a random computer generated quiz.

Atari 16k Tape: \$19.95

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JOYSTICK DRAW

Joystick Draw is the simple way to explore your artistic talents! Program operation is easy enough for a child to use, but effective enough that TCE uses it to design many sophisticated high-resolution graphic screens. Joystick Draw's design allows you or your child to save those masterpieces for future revisions or for use in other programs (instructions included). Your child will spend many hours enjoying this program and at the same time improving his or her eye hand coordination! You will find Joystick Draw to be an easy way to design those more sophisticated graphics for your own programs!

CoCo 16K ECB Tape: \$16.95



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SPELL BOMBER

As captain of your ship, you must destroy the enemy bomber by spelling the mystery word. In this exciting and educational game the bomber gets closer with each inaccurate letter. You have only EIGHT tries to guess the mystery word or your ship will be bombed! If you guess the word correctly, GENERAL QUARTERS will sound and your ship will fire a missile to destroy the bomber. Three levels are available: EASY, MEDIUM, and HARD. Challenging for all ages!

Atari 16K Tape: \$18.95

CoCo 16k ECB Tape: \$18.95 Disk: \$22.95

Vic 20 13k Tape: \$18.95

SPELLING BEE

The word is pronounced vocally and it is up to you to type in the correct spelling. If wrong, the computer will be your friend and flash the word on the screen for just an instant. OK! Try typing the word in again. STILL WRONG! The computer wants success and allows you to see the word again this time a little longer. If you just can't spell the word, the computer realizes you need to learn to spell the word and leaves the word on the screen for you to copy. Try your best and the computer has a surprise for your reward!

SPELLING BEE I ... GRADE 1 & 2 SPELLING BEE III ... GRADE 5 & 6

SPELLING BEE II ... GRADE 3 & 4 SPELLING BEE IV ... GRADE 7 & 8

CoCo 16k ECB TAPE: \$16.95 Each

TC—INVENTORY

Many insurance companies offer a discount for policy holders which have complete inventories on file. TC — Inventory is designed to help you organize, maintain, and compile the personal belongings of your home. Program is user friendly and menu driven. TC — Inventory allows input for location of item, price of item, serial number of item, date of purchase, and a text written description of the item. Don't put off recording your personal belongings until its too late. Requires printer for hard copy.

CoCo 32k ECB Tape: \$16.95

TEACHING CLOCK



Torn between teaching time on a digital or a conventional (face and hands) clock? Well, this program combines the two using high resolution graphics and prompts! Your child will learn to tell time with the aid of a specially designed CLOCK! Child enters the time, if wrong, the center of the clock displays a graphic aid. If the child is correct a musical reward is heard. Program offers three levels: hours, quarter hours, and five minute intervals.

Apple 48k Disk: \$19.95

Atari 32k Tape: \$16.95

CoCo 16k ECB Disk: \$19.95 Tape: \$16.95

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